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HYPERTROPHIC STENOSIS IN INFANTS *

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The data which form the basis of this paper have been derived from a study of 133 cases of pyloric stenosis in infants who have been treated in the wards and private rooms of the Babies' Hospital in my own practice and that of my colleagues, and eight cases which I have seen with physicians outside the hospital, making 141 in all. Of the fatal cases, the stomach has been examined at necropsy in thirty-five. Microscopic examinations of the stomach have been made in twelve cases by Dr. Wollstein, pathologist to the hospital. Of the infants who recovered, three have been lost sight of; ten died subsequently from other conditions; the remaining sixty-four have been followed almost up to the date of writing, twelve of them for a period of four years or over.

Pyloric stenosis of infancy has been regarded by some writers as essentially a condition of tonic muscular spasm, hypertrophy when present being secondary. Others have considered the essential lesion to be a congenital hypertrophy with spasm superadded. Still others have argued that there are two distinct types of cases — one purely spasmodic, the other hypertrophic.

The clinical course and the uniform pathologic findings have convinced my colleagues as well as myself that a division of cases of pyloric stenosis of infants into spasmodic and hypertrophic types is not admissible. There are seen in early infancy a variety of gastric disturbances which may present some of the symptoms of hypertrophic stenosis, but careful observation shows that they are quite distinct from them. Cases of true hypertrophic stenosis, however, differ much in degree; in very few is the obstruction complete, but hypertrophy, undoubtedly congenital, is the essential lesion in all, spasm being added as a secondary condition. Dent[1] found the hypertrophy in a 7 months' fetus. It is inconceivable that the hypertrophy such as has been found by operation to exist two or three weeks after birth could have developed as a result of spasm. Furthermore, I hold that persistent spasm of the pylorus without hypertrophy has not yet been established.

Assuming that the hypertrophy is congenital, it might be expected that symptoms would begin to show themselves soon after birth. But this is almost never the case. Seldom (in only 4 per cent. of our cases) do they begin before the end of the first week, and more often not for two, three or four weeks, during which time the infant appears in every way normal. It does not appear that hypertrophy alone often produces sufficient narrowing to cause symptoms, at least not in infancy. Not until spasm is added do symptoms usually begin. What is it, then, which excites the muscular spasm on which the symptoms so largely depend? Regarding this we know as yet very little.

The great majority of the cases are among infants entirely breast fed, and comparatively few have shown previous evidence of any gastric disorder. But the stomach in early infancy is a highly sensitive organ, and just as disordered innervation of the intestine a few months later may excite intussusception, so now some trivial irritation may be sufficient to excite spasm of the pylorus. We have seen relapses or a recurrence of forcible vomiting and active peristalsis excited by disturbances of digestion after these symptoms had been absent for some weeks.

It is our firm belief from our observation of these patients in the early weeks that in all cases hypertrophy precedes the tonic spasm. That the hypertrophy continues long after the spasm has subsided we have absolute proof. We have repeatedly observed cases in which an unmistakable tumor could be felt for weeks after vomiting had subsided, the stools had been quite normal and peristalsis had entirely ceased.

The number of cases is now considerable in which the tumor has been found still present at necropsy in children who have died from other causes some time after operation or recovery without operation.

In Morse's[7] case the tumor was still present at necropsy in a child who died of acute disease six and a half months after a successful gastro-enterostomy.

In Howland's[8] case the tumor was present in a child who died four months after recovery without operation.

In Lewis and Grulee's[9] patient, operated on by gastro-enterostomy at 2 months and dying eight and a half months later, the tumor was approximately of the same size and consistency as that found at operation.

In Walton's[10] case, a child dying seven months after a gastro-enterostomy, the tumor was still hard and thick, and the pylorus impervious.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the author's reprints.

* Frederick A. Packard Lecture, delivered at Philadelphia, Feb. 13, 1917.

1. Dent, C. T., quoted by Cautley: Diseases of Children, 1910, p. 265.

7. Morse: Boston Med. and Surg. Jour., 1908, **158**, 480.

8. Howland: Personal communication to the author.

9. Lewis, Dean, and Grulee, C. G.: The Pylorus After Gastro-Enterostomy for Congenital Pyloric Stenosis, THE JOURNAL A. M. A., Jan. 30, 1915, p. 410.

10. Walton: Ann. Surg., 1914, **60**, 342.

We are able to add four cases of our own in which late examinations have shown the persistence of the tumor. One child died of diphtheria six months after a gastro-enterostomy; a second died by accident two years and two months after a gastro-enterostomy, and a third of pneumonia twenty-one months after a gastro-enterostomy. In all these the tumor was still present at necropsy, and its condition was similar to that present at the time of the original operation. In the fourth case, a child returned to the hospital four years and seven months after a gastro-enterostomy for an operation on a ventral hernia, a sequel of the early laparotomy; the examination of the stomach in this case also showed the pyloric tumor to be still present.

CLINICAL PICTURE

An infant, usually breast fed, who has nursed well, gained normally in weight, has had sufficient and well digested stools and, in fact, has shown few or no signs of disturbance, begins to vomit persistently and forcibly. These symptoms have their most frequent beginning in the third or fourth week of life, and in most cases their onset is abrupt and without assignable cause. To the forcible vomiting are added marked constipation, steady loss in weight, and all the symptoms belonging to failing nutrition. Careful examination reveals definite gastric peristaltic waves, and in most cases a palpable tumor in the pyloric region.

So characteristic is the vomiting in these cases, as to the time of its occurrence, the manner in which it takes place and the matter vomited, that one can often make the diagnosis from this symptom alone. It differs markedly from the usual vomiting seen in young babies, in that it occurs soon after nursing, often while the child is still at the breast. It is forcible and projectile; the food is fairly shot out of the mouth, sometimes for a distance of 3 or 4 feet. It is in large amounts, usually the entire contents of the stomach, and generally it is repeated after each feeding. If the vomiting is infrequent, and does not occur after every feeding, the amount ejected at one time is often much larger than the amount taken at the last feeding. The frequent regurgitation of small amounts of food is seldom seen. The vomiting is unaccompanied by fever or pain, and in the beginning and usually for some time there is no impairment of appetite. Immediately after emptying the stomach the child may seem so hungry as to take a full feeding. Finally, the vomiting is persistent. Nearly every change of food has a surprising effect in temporarily lessening the vomiting, but in a day or two it returns and is as severe as ever.

The waves of gastric peristalsis have been so often described that a repetition is hardly necessary. Intestinal peristalsis may be mistaken for them, though rarely, indeed. Visible gastric peristalsis is, I believe, a constant symptom of these cases. In the great majority of cases the waves are typical and unmistakable, though in some they may not be observed unless the patient can be frequently seen and closely watched under the most favorable conditions, the most important one being that observations are made immediately after filling the stomach, and that the child is quiet. Slight atypical waves may be seen in a variety of conditions other than hypertrophic stenosis. But the deep, regularly recurring waves passing from left to right and frequently followed by vomiting are a conspicuous feature of nearly every case.

While a palpable tumor cannot be considered essential to the diagnosis, it will usually be found by a careful observer under favorable conditions. In fully three fourths of the cases it is unmistakable; but I have seen men of much experience unable to feel a tumor when one was afterward shown to be present, and I have known men to be quite sure that they felt a tumor when none could be demonstrated at necropsy or operation. The tumor is more distinct in the most severe cases. It may persist for months in cases in which recovery occurs without operation. The tumor is felt as a small movable mass about 2 cm. in diameter and 3 cm. long. It is most frequently found about 3 cm. to the right of the navel and a little above it, but there is liable to be considerable variation in position.

Abnormal gastric retention is easily estimated by emptying the stomach two, three or four hours after a test meal by means of a simple suction apparatus composed of a rubber catheter, a small laboratory wash bottle and a suction tube. The test meal which we have usually employed consists of 2 or 3 ounces of breast milk; diluted condensed milk answers the purpose; but one should not employ mixtures of unboiled cow's milk, as the coagulated milk in the stomach may block the tube. Simply passing the stomach tube is not enough; considerable suction must be employed to empty the stomach completely. In doubtful cases, several observations should be made or the retention determined even after each feeding. In few of these cases is the pyloric opening completely closed; but the determination of the amount of retention gives perfectly definite evidence to the extent of its occlusion, quite as reliable as the Roentgen ray after bismuth.

The secondary symptoms, constipation, wasting, scanty urine, etc., are simply a result of the vomiting. In the most severe cases the closure of the pylorus may be complete and the stools contain no fecal matter, resembling meconium. In most cases some food passes the pylorus, and the stools contain some solid fecal material.

Wasting is a constant symptom, and its rapidity is the best guide to the seriousness of the case. In the more marked types, the loss in weight frequently amounts to 2 or 3 ounces a day.

In the milder type of cases, though gastric peristalsis is marked, the vomiting may occur only two or three times a day, and occasionally there may be none for days together. The bowels move without medicine, and the stools are fecal, and often in normal amount. The weight may be stationary, or at times there may even be a slight gain. Gradually, in the course of from six weeks, but sometimes not till four or five months, the vomiting ceases altogether, the peristaltic waves are no longer seen, and the patient to all appearance has recovered. Even in these cases the typical tumor is often to be felt for several weeks, and in three of my patients it was noted as late as the sixth month.

In the severe cases the course is progressively from bad to worse. The vomiting is constant, little or nothing being retained; the bowels move only from enemas or medicine. The loss of weight may amount to a pound or more a week; the infants waste to skeletons, and when untreated usually die of inanition in from two to four weeks from the onset of symptoms. Between these extremes, cases of all degrees of severity are seen.

DIAGNOSIS

Enumerated in the order of their diagnostic importance I should place the points in this order:

1. The history, if obtained from a reliable mother or nurse.
2. Abnormal gastric retention, observations being repeated four or five times at least.
3. Peristaltic waves, not of diagnostic value unless typical.
4. The presence of a palpable tumor.
5. Wasting, constipation, scanty urine, etc.

I have placed tumor fourth in importance. Many would put it second. Though a palpable tumor is readily found in the great majority of the cases, there is in quite a considerable number a degree of uncertainty regarding it, and I have seen equally good observers differ often on this point. In any case, the diagnosis should not rest on the presence of a tumor, and, most of all, a decision regarding operation should not depend on it.

Stress has been laid by some writers on the value of the Roentgen ray in diagnosis. It does show whether the bismuth meal is passing through the pylorus, and the rapidity of its passage, and also whether or not the stomach is able to empty itself completely. In few of the cases is there complete obstruction at the pylorus. It is doubtful whether the Roentgen ray tells more than can be learned from careful observations of the gastric retention as described above. Furthermore, it must be remembered that these patients are very young, most of them in bad condition, and that they bear the manipulation incident to successive investigations with the bismuth meal badly. I have known one instance in which, after a series of such observations which occupied nearly twenty-four hours, the diagnosis was finally reached and the surgeon summoned, but the child was dead when the surgeon reached the bedside. While in some early cases, with the infants in good condition, useful information may be obtained by a series of Roentgen observations with the vast majority of infants it is extremely doubtful whether the results are commensurate with the risks incurred.

The principal difficulty in differential diagnosis is to distinguish cases of gastric indigestion with protracted vomiting from those of hypertrophic stenosis. This is especially difficult, as in the former gastric contraction and even small peristaltic waves may sometimes be observed; but these are usually slight and atypical, and are only occasionally seen even with the closest observation. The diagnosis is to be made by the absence of the other characteristic features of hypertrophic stenosis—the history, tumor and retention. The point should be emphasized that slight gastric peristalsis, even when accompanied by frequent vomiting, which at times may be forcible, does not warrant the diagnosis of hypertrophic stenosis.

There are certainly a number of conditions other than hypertrophic stenosis in which pyloric spasm is present. Pyloric spasm with gastric peristalsis has been repeatedly observed in infants with ulcer of the duodenum. Distinct gastric peristalsis was recently observed in the Babies' Hospital in an infant 4 days old with a congenital atresia of the esophagus. The introduction of food or water was followed in this patient by distinct gastric peristalsis, though the necropsy showed that the fluid never passed beyond the middle of the esophagus. The pylorus was normal. We have seen one instance in which pressure on the upper part of the duodenum by a congenital band gave rise to persistent, forcible vomiting and marked gastric peristalsis, suggesting hypertrophic stenosis; but the vomiting began from the first days of life and was bilious in character. In another recent case, which an exploratory operation revealed to be one of tuberculous peritonitis with a normal pylorus, there had been frequent vomiting, at times forcible, and definite gastric peristalsis. There was a general matting together of the intestines from the tuberculous inflammation, but no definite pressure on the upper intestine.

It is evident, then, that there are quite a large number of different pathologic conditions in which gastric peristalsis and presumably pyloric spasm may be occasionally seen. To confuse these cases with hypertrophic stenosis, or to consider them as closely allied pathologic conditions just because they have one or two symptoms in common does not seem justifiable. It has greatly obscured the discussion of the subject. Hypertrophic stenosis should be regarded as a pathologic entity, though its symptoms vary greatly, according as the lesion is mild or severe.

MEDICAL TREATMENT

The medical treatment of hypertrophic stenosis consists in careful feeding and stomach washing. The gastric lavage should be practiced at first twice a day, and later at longer intervals; it serves the purpose of emptying the stomach thoroughly of mucus and fermented food; the water should be used warmer than usual, that is, up to 112 F. If it can be secured, breast milk is the preferable food, but one not rich in fat is desirable. The common practice of weaning as soon as symptoms develop is most unwise. In default of breast milk, a modified milk mixture low in fat should be employed.

With respect to quantities and intervals of feeding, cases respond differently. We have usually depended on from 1 to 3 ounces at three or four hour intervals, or small quantities and shorter intervals, especially if the food is breast milk. With the longer intervals, water should be given between feedings. In greatly prostrated patients, hypodermoclysis should be used daily; from 150 to 250 c.c. of 4 per cent. dextrose may be given in a saline solution at one time. Rectal feeding is of little assistance. The bowels are usually best moved by enema. I believe that drugs and local applications of heat over the epigastrium for the purpose of allaying the spasm are of little value. The weight should be carefully watched and taken daily, as it is the best guide to the patient's condition and progress.

SURGICAL TREATMENT

The first recorded operation for hypertrophic stenosis in infancy of which I can find record was that by Cordua[11] in 1893. The operation was a jejunostomy; the patient did not recover. I have found no more operations reported until 1898, when two done by Willy Meyer[12] of New York were reported, and a few weeks later one by Stern[13] in Germany, the operation, however, having been done some months before. These three were all gastro-enterostomies, and in none did the patient recover. After the year 1900 the number of patients operated on steadily increases, though Shaw and Elting,[14] writing in 1904, could find recorded up to that time, including their own case, but thirty-nine operations, with seventeen

11. Cordua, referred to by Grisson: Deutsch. Ztschr. f. Chir., 1904, 75, 111.
12. Meltzer and Meyer: Med. Rec., New York, Aug. 20, 1898.
13. Stern: Deutsch. med. Wchnschr., 1898, 24, 601-604.
14. Shaw and Elting: Arch. Pediat., 1904, p. 893.

recoveries. Only five of these operations had been done in this country.

In 1908, Dufour and Fredet[17] collected published results in 135 operations which included the foregoing, and showed a mortality of 50 per cent.

This certainly was not a very encouraging showing, and the results led Heubner and Pfaundler and others in Germany, and Hutchinson in London to inveigh against operation altogether, and to take the position that the great majority of the cases could be cured by medical means alone and that surgery was seldom if ever to be invoked.

With experience and improved technic during the next few years, surgeons in this country, particularly Scudder,[18] Downes[19] and Richter,[20] obtained much better results than those reported above; but still the general mortality attending operation was so high that physicians were loath to refer patients for operation, particularly when medical treatment was advocated by such high authorities as those mentioned.

In 1913, Rammstedt[21] of Münster reported a successful case in which he simply divided the circular muscular layer of the pylorus by external incision. In his case, a typical one, the patient made an excellent recovery. He advocated this procedure as a substitute for the older operations—gastro-enterostomy, divulsion and pylorplasty—then in vogue. The great advantages he claimed were that the stomach was not opened and the duration of the operation was much shortened. In his case it required only fifteen minutes,

TABLE 1.—RESULTS IN ONE HUNDRED AND THIRTY-FIVE OPERATIONS

Groups	Cases	Recoveries
Gastro-enterostomy	52	22
Divulsion	36	21
Pyloroplasty	22	13
Various modifications and combinations	25	12
Total	135	68

as compared with from thirty to fifty minutes needed for most of the other operations.

So far as I have been able to learn, this single case was the only one he has ever reported. But the operation was taken up by the surgeons of the Babies' Hospital, first by Dr. Alfred S. Taylor and then by Dr. William A. Downes, and now for over two years has been the only operation done in that institution.

In Table 2 are given the results obtained by medical treatment and by the older and the more recent surgical treatment in the patients who have come under my observation in private practice and those admitted to the Babies' Hospital in my own practice and that of my colleagues, Drs. Downes, Taylor, Kerley and Bartlett.

Rammstedt's operation of external muscle division has been done in the hospital up to January, 1917, in sixty-seven cases, all but one of these by Dr. Downes. Up to January, 1915, it was done occasionally, in all, on six patients. Since that date it has been done exclusively in the institution. In nineteen of the first twenty cases, in order to make sure that the constriction had been completely divided, the stomach was opened and a sound passed through the pylorus. This was then decided by the surgeon to be quite unnecessary, and hence discontinued in the last forty-seven operations. It certainly adds to the operative risk.

The comparison of statistics of different men in different cities with different types of cases is not such conclusive evidence of the value of any plan of treatment as is a comparison of results in a single institution where the general run of cases is much the same, where all the operations have been done by the same surgeon and where the after-treatment followed was identical.

Including my private cases and the patients operated on at the Babies' Hospital, there were forty-one gastro-enterostomies with a mortality of 51 per cent.; of the twenty-eight cases in which operation was performed by Dr. Downes, the mortality was 43 per cent. Of the sixty-seven cases in which the Rammstedt operation was performed, the mortality was but 24 per cent.

The advantages of this operation are evident to one who has had experience with the other operations proposed. First in importance may be mentioned the time required. Seldom does the entire operation consume over fifteen minutes, and it is often completed in ten. The stomach is not opened, and the risks of nonunion, leakage and peritonitis from this cause are eliminated. Hemorrhage is seldom troublesome; no suturing is required, and a minimum handling of the viscera. So much for the surgical aspects. Our experience has shown that the shock is much less severe; the temperature reaction is less marked; food can be pushed more rapidly, and disturbances of digestion, particularly diarrhea, which has been so troublesome a symptom after gastro-enterostomy in more than half our cases, are much less frequent and less severe. This is undoubtedly due to the fact that the food passes normally into the duodenum instead of directly into the jejunum.[22]

Experience has shown that there are some special dangers connected with this operation. The most important are the wounding of the mucous membrane, incomplete division of the constricting muscle, and hemorrhage. Wounding the mucous membrane occurred in but three cases in our series, two of them being among the first operations done. Both of these patients recovered. In one other this accident was followed by leakage, peritonitis and death. The incomplete division of the constriction happened but once in our series of sixty-seven consecutive operations. In one child, however, a previous operation in another hospital had not relieved the obstruction, and the symptoms continued; although the obstruction was relieved by the second operation and the vomiting ceased, the patient died of marasmus two weeks later. Both of the accidents mentioned will occur seldom in the hands of an experienced surgeon. The risk of hemorrhage is a slight one, but it should be kept in mind as a possible danger from the operation wound which is left. It has happened but once in the hospital series, and that the patient was a bleeder.

An analysis of the sixteen deaths in the Rammstedt cases is interesting. Six infants died from shock within a few hours after operation, but all of them were in extremely bad condition at the time of operation, and two of them almost moribund. In none had symptoms lasted for less than four and a half weeks, and in two they had lasted over ten weeks. One infant

17. Dufour and Fredet: Rev. de Chir., 1908, p. 208.
18. Scudder: Boston Med. and Surg. Jour., August, 1908; Surg., Gynec. and Obst., 1911, **10**, 275; Ann. Surg., February, 1914.
19. Downes, W. A.: Pyloric Obstruction in Infants, THE JOURNAL A. M. A., June 27, 1914, p. 2019; Surg., Gynec. and Obst., March, 1916, p. 251.
20. Richter, H. M.: Congenital Pyloric Stenosis, THE JOURNAL A. M. A., Jan. 31, 1914, p. 353.
21. Rammstedt: Med. Klin., 1912, **8**, 1702-1705; Zentralbl. f. Chir., 1913, **11**, 3.
22. For details regarding surgical technic, I would refer to the publications of Dr. Downes (Footnote 19).

had whooping cough when operated on, and died from bronchopneumonia on the sixth day. There remain nine deaths connected with the operation or due to the original condition which the operation did not relieve. Three were from peritonitis; one from hemorrhage; one from continued wasting; one from continuance of vomiting, the constriction not being entirely relieved, and in three, death occurred suddenly on the first, second and seventh day, respectively, no cause being discoverable.

Excluding the seven operations which were done under conditions which make it impossible to estimate the value of any operation, there remain sixty cases with nine deaths, a mortality of 15 per cent. This I believe, is the approximate mortality in these cases, taking them as they come. In a hospital like the Babies', where so many long-neglected cases are brought, it will be nearer 25 per cent. It should be remembered that these are chiefly hospital ward patients, and that they represent consecutive admissions. In only a single case in the last five years was operation refused on account of the child's condition. This patient when admitted was 3 months old and weighed, after eight weeks' medical treatment, but 3 pounds, 14 ounces; she lived only a few hours.

AFTER-TREATMENT

The success of operative measures in this condition is dependent in no small degree on the after-treatment. For a number of days after the operation the lives of these little patients often hang by a slender thread, and errors in judgment, especially with regard to feeding, often have the most disastrous consequences. It is, then, of the highest importance not only that the operation be done by a skilled surgeon, but also that the infant after the wound is closed be under the care of one equally skilled in the postoperative management.

From January, 1910, to January, 1917, there were 101 operations done at the Babies' Hospital. The postoperative management which has gradually been evolved as a result of the experience of the surgeons, the attending physicians and the resident medical staff has been fully detailed in a recent publication by Dr. Edward Morgan,[23] former resident physician. It will be given here only in outline.

It is to be borne in mind that practically all these infants are between 4 and 8 weeks old at the time of operation, and that they all have become much reduced in vitality as a result of loss in weight (often amounting to 3 or 4 pounds) and several weeks of protracted vomiting. It is of the first importance, therefore, that everything be done to conserve every particle of strength which the infant possesses. Exposure during operation should be the smallest possible. The room should be warm and the patient protected still further by artificial heat. Before the anesthetic is given, the stomach is emptied of food, gas and mucus. Stimulants during the operation are rarely called for. After removal from the table, the infant is wrapped in hot blankets and placed in a bed surrounded by hot water bags. The head of the bed is kept lowered until the effect of the anesthetic has passed off. As a means of introducing fluids into the tissues of these infants, often completely dehydrated as a result of the previous vomiting, nothing compares with hypodermoclysis. From 120 to 240 c.c. of a physiologic sodium chlorid solution are given, usually between the scapulae, and it is surprising how rapidly this is absorbed, even in some of the worst cases. Of stimulants given hypodermically, epinephrin has given us the most satisfactory results in doses of from 3 to 5 minims of the 1:1,000 solution. With the precautions mentioned, the small amount of shock to these patients from laparotomy is often amazing.

Feeding is usually begun as soon as the child has entirely recovered from the anesthetic. The position now used is with the head raised, sometimes to the semierect posture, so as to facilitate the expulsion of gas. Breast milk is indispensable, but it must be given at regular intervals and in carefully measured quantities, or serious disturbances of digestion may ensue, sometimes with fatal results, when everything previously has gone exceptionally well. The amount of food should be at first small, not over 2 or 3 teaspoonfuls of breast milk diluted with 1 or 2 teaspoonfuls of water. This is given with a medicine dropper and repeated in gradually increasing amounts every three hours. Water is given between the feedings in similar quantities. At the end of twenty-four hours, the infant is usually taking 4 or 5 teaspoonfuls of breast milk undiluted, and at the end of two days 1 ounce every three hours. These quantities are gradually increased to about 2 ounces by the fifth or sixth day, and at a week or ten days, but not before, the infant may be put to the breast. At first this should be for only two or three minutes. For the first month or two, artificial feeding presents unusual difficulties, and can seldom be successfully carried on except by one with much experience.

The administration of a teaspoonful of castor oil at the end of twenty-four hours is a routine practice whose beneficial results we seldom have had reason to doubt. It aids in the expulsion of gas and mucus, and seems to add much to the comfort of the patient. Often all disposition to vomit ceases as soon as the bowels have acted freely. Constipation after this is uncommon, but not infrequently diarrhea occurs. This was much more often seen when gastro-enterostomy was done than after the Rammstedt operation. In the former, particularly, it may be a most troublesome symptom for several weeks. The most successful measures for controlling this have been the substitution of protein milk (*Eiweissmilch*) for part of the breast milk, and the administration of moderate doses of bismuth and opium, since in the majority of the patients the chief factor in the diarrhea seems to be excessive peristalsis.

Some vomiting is to be expected during the first twelve to twenty-four hours. It is most frequently due to accumulation of gas in the stomach, and is relieved by posture or by passage of the stomach tube. It may be due to a too rapid increase in the food or sometimes apparently only from a persistence of the hyperesthesia of the gastric mucous membrane. Defects in the operation itself, when the obstruction has not been entirely relieved, may lead also to a continuance of the vomiting; finally, vomiting occurring after the third or fourth day may be due to peritonitis.

MEDICAL VERSUS SURGICAL TREATMENT

On the whole, is medical or surgical treatment of hypertrophic stenosis in infancy to be advised? It must be admitted that there appears to be considerable difference of opinion among those with some experience in this disease. To what is this difference of

23. Morgan, E. A.: The Postoperative Management of Pyloric Stenosis, Am. Jour. Dis. Child., April, 1916, pp. 245-256.

opinion due? Are the physician and the surgeon talking about the same clinical and pathologic conditions? I do not believe that they always are. There are, I believe, a number of pathologic conditions in early infancy associated with vomiting which have many of the symptoms seen in hypertrophic stenosis, but which on close study are seen to be quite different. There are also different conditions in which there is visible gastric peristalsis. Even this symptom does not put the case in the same class with those we have been discussing. A large proportion of such patients recover with medical treatment only, as do also many of those of hypertrophic stenosis of the milder type, although probably in many of them the correct diagnosis is not made.

Let us drop these two groups of cases from our discussion and consider only the patients with hypertrophic stenosis as they are admitted to hospitals or as the pediatrician sees them. Such patients have usually been first in the hands of the general practitioner. Few of these cases have been recognized or received proper early treatment. They have generally been looked on as difficult feeding cases. In most of them the first thing done is to wean the baby, on the supposition that the mother's milk is at fault—usually the worst possible advice. Every conceivable change in food formula is made with the expectation of controlling the vomiting, but with no result, or at most only a temporary benefit. The average duration of the symptoms before the child is brought to the consultant or admitted to the hospital has been in our experience four weeks. Seldom are any but the most severe types seen as early as the second week.

The problem, then, of the infant with hypertrophic stenosis as the surgeon and the hospital physician sees it is that of a baby 7 weeks old, weighing 7 pounds, who has been vomiting for four weeks; such at least are our average figures. In some there is a history of continuous vomiting for two weeks or more and rapid loss in weight amounting to 2 or 3 ounces a day. In other cases, alternations of improvement and relapse have perhaps continued for two or three months.

The principal medical risk is of acute inanition, which may come on quite rapidly; and in the most severe type of disease, the infant may quickly sink to so low a point that it is impossible to save him by any means. In the less severe types there is the danger from slow marasmus, especially in hospitals and with patients in poor surroundings. In some of these cases the vomiting may be insignificant and the stools fecal, yet the child may slowly lose weight till his condition is hopeless, or he may die quite suddenly when apparently as well as for several days before. This is particularly apt to be the case unless the weight is closely watched and the actual amount of food retained is carefully recorded. In hospitals, risks of intercurrent disease are not to be ignored in patients with such feeble resistance as these infants. Finally, there must be considered the possibility of trouble in later life from these cases not treated surgically.

Certain surgical risks are unavoidable and belong to any operation as serious as a laparotomy. The chief one with these patients is shock, which in most cases is surprisingly little, considering the gravity of the operation and the tender age of the patients. Few infants who are in even a reasonably good condition die from shock; though with those in whom the disease has not been recognized or has been long neglected, this is important. All the surgical dangers — shock, leakage, sepsis, hemorrhage — are greatly lessened by the substitution of the ten or fifteen minute operation proposed by Rammstedt for a gastro-enterostomy, which takes three or four times as long. After the Rammstedt operation also not only these grave dangers, but all the complications and sequelae are much less frequent and less severe. The reactionary temperature is not so high, and vomiting and diarrhea, both often troublesome after gastro-enterostomy, are relatively seldom seen; the food can be begun earlier and increased more rapidly, convalescence is altogether much shorter, and gain in weight in most cases begins by the end of the second week and thereafter proceeds as in normal infants.

If the child is seen in private practice with the possibilities of the best care and most intelligent feeding—particularly breast feeding—if the weight is stationary or the loss in weight is not great and the child still in good condition, if the vomiting is only two or three times a day, if the stools are fecal, waiting is to be advised.

On the contrary, if the weight has fallen to 6 pounds or below and the loss is still going on, if the vomiting is continuous, if there is marked gastric retention, if the stools contain no fecal matter, no time should be lost, but immediate operation advised, particularly in a hospital.

My early personal experience led me strongly to favor the medical treatment of these cases. I was greatly influenced by a few conspicuous successes in a few patients treated without operation, and also by the results of the first seven cases in which I saw operation done, five of the seven having been fatal. Increased experience has shown that the average case medically treated, unless it shows improvement in a few days, is liable to run a very prolonged course, even though the child may ultimately recover.

No better argument can be adduced for operative treatment than a comparison of our results at the Babies' Hospital in the three periods into which I have divided our experience (Table 2). During the first period, up to the end of 1911, our policy was operation only after a prolonged trial had been made of medical treatment, surgery being looked on as a last resort.

In the second period, comprising the years 1912, 1913 and 1914, operation was done in nearly every case within forty-eight hours, and the larger number within twenty-four hours, after admission.

During the third period, comprising the years 1915 and 1916, sixty-three cases were treated; sixty-one by operation, all Rammstedts, by Dr. Downes, with a mortality of 23 per cent.

These results have convinced not only myself but all my colleagues in the hospital that with the average infant admitted with hypertrophic stenosis, the immediate performance of the Rammstedt operation offers a better chance of life than any other method of treatment yet proposed.

FINAL RESULTS

It would seem rather remarkable if so marked a pathologic condition as exists in these cases should disappear in a few weeks. The symptoms, it is true, subside completely and, so far as one can positively say, permanently. At least none are seen for years. It is this fact that has led many to regard the essential condition as merely a pyloric spasm; believing that when this has disappeared the patient is well. To this view we cannot subscribe. We believe not only

that hypertrophy precedes the spasm but also that it continues long after the spasm has ceased. Proof of the latter point has already been cited. Most observations on this disease are still recent, and we cannot be quite certain yet in any case that symptoms may not appear later in life. It is true that they have rarely been noted in early childhood. But in the classical case of Beardsley (1788), marked symptoms were noted in the first week of life. They continued more or less severely, and at 2 years were described in language showing that they were typical. The child continued to suffer until his death at 5 years, the necropsy showing marked hypertrophy of the pylorus, considered by the author "scirrhus." The pyloric obstruction was so tight that only the "finest fluid" passed into the duodenum. More and more reports are constantly appearing of hypertrophic pyloric stenosis in older children and early adult life, which are ascribed to a congenial condition.

That hypertrophic stenosis may exist for years before it gives symptoms is shown by the case of Rosenheim,[25] in which a boy had no gastric symptoms until he was over 5 years old. An operation at 6½ years disclosed a hypertrophic stenosis. I have seen but one case of pyloric stenosis in an older child, a girl of 4½ years. In this the diagnosis was established by operation; but there was no history of protracted vomiting in infancy, and definite gastric symptoms did not begin until the patient was 3 years old.

In my own series of cases I have been able to follow for any length of time only seven patients who recovered without operation—one for eleven years, one for seven, three for six, one for five, and one for four years. All were in excellent health and only one had vomiting attacks after his initial recovery, and these ceased entirely at the age of 8 months. None who had been observed for shorter periods had shown any symptoms after the first year.

Turning now to the final results in the operative cases, I shall first consider those after gastro-enterostomy. Of the twenty patients who recovered, one died two weeks and one four weeks after operation, of enterocolitis; one died after four months, of diphtheria; one after two years from accident; one, twenty-one months after from pneumonia, and one was lost sight of. The remaining fourteen patients have been followed up to the last few weeks. One seen after eleven and a half years is a well grown, normal boy. Four were followed for from four to five and a half years; all were then quite well, but one had suffered from occasional attacks of vomiting up to his third year. Of eight followed for from two to two and three quarter years, all were strong and healthy; but one suffered from vomiting attacks for nearly a year after operation. Roentgen observations in cases two or three years after gastro-enterostomy showed that the food was still passing through the operative wound. Judging from the histories of these patients, the operation of gastro-enterostomy in no wise interferes with the normal growth and development of children.

The Rammstedt cases (Table 3) have necessarily been observed for a much shorter time, but long enough to establish the fact that this operation does relieve the obstruction at once and completely. Of the fifty-one infants who recovered, five died subsequently.

The remaining forty-six infants have been followed up to the last few weeks. The time elapsing from the operation to the date of last report was:

In four cases, between 2 years, 2 months, and 3 years.
In fourteen cases, between 1 year, 6 months, and 2 years.
In twelve cases, between 10 months and 15 months.
In eleven cases, between 5 months and 8 months.
In five cases, between 1 month and 4 months.

When seen, these children were almost without exception in the best of health; they were plump and rosy-cheeked, nearly all above average weight, and as fine a group as one would care to see.

TABLE 2.—RESULTS OF MEDICAL TREATMENT AND THE OLDER AND THE MORE RECENT SURGICAL TREATMENT *

	Cases, No.	Recovered, No.	Died, No.	Mortality, Per Cent.	Average Age, Weeks	Average Weight Pounds
First Period, 1901-1911:						
Without operation	24	10	14	58	...	...
Operation (Gastro-enterostomy)	17	7	10	58	...	...
Total	41	17	24	58	7.3	7.6
Second Period, 1912-1914:						
Without operation	7	3	4	57	...	...
Operation (Gastro-enterostomy, 24; Rammstedt, 6)	30	17	13	43	...	...
Total	37	20	17	45.9	6.6	7.7
Third Period, 1915-1916:						
Without operation	2	1	1	50	...	...
Operation (Rammstedt)	61	47	14	23	...	...
Total	63	48	15	23.8	7.0	6.8

* In the first period, operation was performed generally after medical treatment; in the second period, usually soon after admission, and in the third period, always soon after admission. The average duration of symptoms on admission in each group was 4.2 weeks.

TABLE 3.—RAMMSTEDT'S OPERATION AT BABIES' HOSPITAL *

	Cases, No.	Deaths, No.	Mortality, Per Cent.
Prior to 1915	6	2	33
1915	35	10	28.5
1916	26	4	15.3
	67	16	24

* Three patients died from gastro-intestinal conditions subsequently (4 weeks, 6 weeks, 7 weeks); one patient died from empyema (3 months) and one from pneumonia (4 months); forty-six have been followed and are well to date.

Our experience, I think, warrants the conclusion that the Rammstedt operation meets the indications in this condition. If this simple procedure does this, then there is no longer any justification for the other more serious surgical procedures which have been employed in the past.

CONCLUSIONS

1. Hypertrophic stenosis of the pylorus in infancy is a pathologic entity. It should not be confused with other pathologic conditions which may be accompanied by vomiting and occasional gastric peristalsis.

2. In many of the milder forms, the patients recover with only medical treatment.

3. All those who do not improve under such treatment in the course of two or three weeks should be

25. Rosenheim: Berl. klin. Wchnschr., 1899, **32**, 703.

treated surgically; with the more severe types only a short delay is permissible.

4. The symptoms which indicate surgical intervention are rapid loss in weight, persistent, forcible vomiting, and active gastric peristalsis; the presence of a palpable tumor and abnormal gastric retention aids much in diagnosis.

5. The Roentgen ray reveals nothing of importance which cannot be discovered by a study of gastric retention, and without its dangers.

6. The patients who come under observation after four or five weeks of vomiting and marked loss in weight are best treated by operation as soon as the diagnosis is established.

7. The earlier operations of gastro-enterostomy, divulsion, pylorplasty, etc., were unduly severe and prolonged; they should be abandoned for the simple external division of the circular muscular fibers proposed by Rammstedt.

8. Results by the same operator, on the same class of patients in the same institution and with the same after-treatment, show the great superiority of the Rammstedt operation to gastro-enterostomy and to medical treatment.

9. Skilled after-treatment is quite as essential to good results as good surgical technic.

10. Cases of gastro-enterostomy followed from four to eleven years indicate that growth and development are not impaired by the operation.

11. Cases followed two and three years after the Rammstedt operation show no interference with health and progress.

12. Patients not operated on usually show no symptoms after the first year. Yet the possibility that this condition may be the basis of pyloric obstruction in later life undoubtedly exists.

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ANAPHYLATOXIN AND ANAPHYLAXIS*

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It is our purpose to summarize the results of investigations which are published concurrently, under the same general heading, as a series of ten articles in the May and June numbers of the *Journal of Infectious Diseases*. For details, the reader must consult the experimental work there given. Although the problem primarily concerns a laboratory research, it nevertheless touches on matters of great importance in medicine. It will be realized that a new conception in physiology is inseparably bound up with problems in pathology and hence in disease. Thus, it is with the great questions of anaphylatoxin and anaphylaxis which, beginning with the observations of the French physiologist Richet, have claimed the attention of many workers, in many countries, during the past fifteen years. Many explanations have been brought forth to account for these reactions, and it would seem as if all possible interpretations had already been presented. Yet, as the result of an intensive study extending over a period of three years, we have arrived at an entirely different view, one which reveals these phenomena in a new light.

We were led to take up this investigation through a series of observations made in the course of a study of certain tropical diseases of animals, namely, the trypanosomiases, known as surra and nagana. In endeavoring to immunize against these diseases by injecting dead cultures of the trypanosomes, it was found frequently that severe toxic effects with marked hypothermia followed such injections. When these were repeated, chronic intoxication resulted which usually terminated fatally. For this reason it was not possible to secure a high degree of immunity, and it was clear that no progress could be made until a better understanding of this intoxication was reached. Laveran had encountered the same effects, and ascribed them to a "trypanotoxin." Similar effects have been known for a long time in connection with bacteria and led to the conception of "endotoxins."

PRODUCTION OF ANAPHYLATOXIN BY TRYPANOSOMES

The resemblance of the action of trypanotoxin to that of anaphylatoxin led us first to study the trypanosomes in their relation to anaphylatoxin production. Several investigators had already touched on this question. They found that if the *Trypanosoma brucei* was incubated with guinea-pig serum for two hours, and this mixture was then iced for from twelve to twenty hours, the serum thus treated was toxic in a dose of 3 c.c., because of the formation of something which is called anaphylatoxin. In our investigation, five different species of trypanosomes were employed, and it was possible to show that they all behaved in exactly the same way. Whether living or dead, on contact with serum they rendered it poisonous. Two fundamental facts were learned: first, that the rat serum was a most excellent reagent, better than any other serum hitherto used, and second, that the toxification occurred at great speed. Instead of incubating for hours, it was possible to render a serum fatally toxic in two or three minutes. Indeed, with rat serum it was possible to make this so toxic that in a dose of 0.25 c.c. it would kill guinea-pigs within three minutes after the injection. Never before had so powerful an anaphylatoxin been produced, or in so short a time.

A given mass of trypanosomes could be used to toxify different lots of serum, and in one experiment twenty consecutive tests were thus made without any apparent decrease in the ability of the organisms to make this poison. This study showed that the poison did not reside within the cells of the parasite, but that in some way it was produced out of a matrix present in the serum. The poison thus produced, when injected into animals, caused typical anaphylactic shock and death. It was shown that a ferment was not concerned in the production of this poison.

PRODUCTION OF ANAPHYLATOXIN BY AGAR

After it had been found that anaphylatoxin was produced by these organisms, it was in order to inquire as to what anaphylatoxin was, and how it was produced. This led us to study other agents which have been known to produce anaphylatoxin, and because of convenience we made use of agar. Bordet of Brussels had previously shown that when agar was incubated with guinea-pig serum for an hour or more, anaphylatoxin resulted. Accordingly, an extensive series of tests was made with agar. Various serums were employed, notably guinea-pig, rabbit and that of the rat. It was possible to show with all of these serums, that the reaction of poison production was

* From the Hygienic Laboratory, University of Michigan.

one of great speed. The physical condition of the agar was very important to the speed of the reaction. With a fine comminution of the agar in a gel state, it was possible to toxify the serums in five minutes or less. In this way, the guinea-pig serum could be made so poisonous that it killed in a dose of 1 c.c., and with rat serum this dose was reduced to 0.25 c.c., and even less. It is noteworthy that an extremely minute amount of agar is capable of making the rat serum toxic; thus 1 part of dry agar can toxify 400,000 parts of serum. Per cubic centimeter of serum, this means 0.0025 mg. of dry agar, and when it is considered that the nitrogenous constituents of agar make up only a minute part of this amount, it will be seen that this result contraindicates Friedberger's theory that anaphylatoxin results from the cleavage of the nitrogenous substances present in the so-called antigen, in this case agar. It may be added that numerous attempts to demonstrate the presence of a ferment which supposedly is concerned with the poison production proved entirely negative.

Previous workers, employing anaphylatoxin which killed in a dosage of about 3 c.c., were unable to test the effect of multiple doses of the poison. With a method which regularly gave a toxic serum such that 0.25 c.c. was fatal, it was possible to test the effect of very large amounts of the poison. In the case of guinea-pigs it was found that the injection of from one to forty lethal doses always caused rapid death, and it was possible to obtain noncoagulable blood when large doses were used. When the poison was similarly tested on rats and rabbits, it was found that these were refractory. The white rat, for example, would tolerate a quantity of poison sufficient to kill seventy-five guinea-pigs; the rabbit tested with forty of such doses likewise showed no effects. These facts proved to be of great importance in the subsequent work.

As it had been shown that agar readily produced a poison when mixed with a serum, it was to be expected that the intravenous injection of agar would likewise lead to poison production in vivo and hence produce a nonspecific anaphylactic shock. The experiments made with this object in view led to remarkable results. With the agar in a suitable physical state it is possible to produce an absolutely typical anaphylactic shock. Moreover, this can be done with very minute amounts of agar. A dose representing 9 mg. of dry agar per kilogram of guinea-pig was found to be fatal. It is a remarkable fact that this dose is less than that of most pathogenic bacteria, and yet these are supposed to be toxic because of the endotoxin which they contain. Agar certainly does not contain an endotoxin, and, such being the case, one is forced to conclude that much of that which in the past has been designated as endotoxin is a myth. The finely divided agar produces the same effect as the pathogenic or nonpathogenic bacterium when injected into a guinea-pig, or when mixed with serum in the test tube; the poison that is produced in either case is anaphylatoxin, and it is not made out of the intracellular contents.

The rabbit and the white rat are less susceptible to the injection of agar, requiring from 20 to 30 mg. per kilogram of body weight. In these also the syndrome is that of typical anaphylactic shock. The fact that the agar kills by producing in vivo the same poison, anaphylatoxin, is demonstrable by making rapid transfusions of blood from the heart of the injected animal into the vein of a guinea-pig.

PRODUCTION OF ANAPHYLATOXIN BY PEPTONE

It having been shown that agar produced anaphylatoxin on contact with serum or plasma, it was next in order to ascertain the mode of action of Witte's peptone. As is well known, this peptone, or proteoses in general, when injected into the vein of a dog causes a rapid drop in blood pressure, and at the same time renders the blood incoagulable. Because of these effects it has been held that anaphylactic shock was due to the formation of peptone or other cleavage products. The injection of peptone into guinea-pigs does produce a typical anaphylactic shock, but it is noteworthy that per kilogram of guinea-pig, 300 mg. are required, or thirty times the amount of agar. The rat and the rabbit are considerably more resistant, the latter requiring 200 times more of peptone than of agar. In other words, peptone is considerably less toxic than agar. In all three species, the injection of peptone yields the syndrome of anaphylactic shock, namely, drop of blood pressure, incoagulability of the blood, distention of lungs, etc.

Of further importance is the fact that when peptone is mixed with rat serum in the test tube it is capable of producing within five minutes anaphylatoxin. And again, transfusion of the heart blood, after injection of peptone demonstrates that anaphylatoxin is formed in vivo as a result of the peptone injection. These facts have a significant bearing on the mechanism of the reaction; since a clear peptone on mixture with a clear serum yields anaphylatoxin, it is difficult to account for this poison production by the prevalent theories of adsorption.

PRODUCTION OF ANAPHYLATOXIN

In order to get an insight into the mechanism of anaphylatoxin production it was necessary to take up the question of the primary toxicity of serum. It is well known that transfusion of whole blood or the injection of large amounts of serum may lead to severe toxic effects. It has, indeed, been asserted that the effects produced are probably those of anaphylaxis. The blood of a normal rabbit when rapidly transfused into the vein of a guinea-pig is usually harmless in a dose of 3 c.c. If, however the blood is held in the syringe for three minutes before injection, it becomes fatally toxic. All bloods become highly toxic in the precoagulation stage, and the effects produced are those of anaphylatoxin. Furthermore, transfusion tests made from the guinea-pig which receives the toxic blood into a normal guinea-pig demonstrate the presence of anaphylatoxin.

These and similar experiments go to show that the reaction which leads to coagulation is accompanied by the formation of anaphylatoxin. When the blood is drawn, catalytic substances form which change (1) the fibrinogen into fibrin, and (2) the matrix of the poison into anaphylatoxin. After coagulation, some of this poison remains in the serum and renders it more or less toxic. The amount of poison present in a serum may be varied, at will, by allowing the clot to remain in contact with the serum, and especially by varying the method of defibrination. Thus, for example, when the blood of a rabbit is divided into two portions and each then defibrinated in a different way, one serum may kill in doses of 2 c.c., while the other will require 6 c.c. to produce the same result.

Normal serum is always more or less toxic, owing to a variable amount of the anaphylatoxin formed during the coagulation process, and alien substances such

as agar, peptone and bacteria, merely increase the amount of this poison. The fact that preclot blood, or defibrinated blood is more toxic than its serum is probably due to the presence of the catalyzer, formed in the precoagulation stage, which induces additional poison production when such blood is injected into the recipient. The further observation that a defibrinated blood, kept at 60 C., coagulates much more rapidly that the clear serum indicates the presence of such disturbing or catalyzing agent.

In the study of specific anaphylaxis, the rat was found to be an invaluable reagent. In line with its resistance to anaphylatoxin, agar and peptone, it was found to be refractory to the anaphylactic shock proper. It does not seem to be possible to produce a fatal anaphylactic shock in a rat which has been previously sensitized to a given antigen, such as horse serum or egg white. If, however, the antigen is diluted with distilled water it will produce a shock. And, furthermore, the mere injection of distilled water into a sensitized rat will cause a shock and even death. By means of the transfusion method it is possible to show that anaphylatoxin is produced in the circulation of the animal thus injected with distilled water. Further, the transfusion of blood from a guinea-pig which has been shocked likewise demonstrates the production in vivo of anaphylatoxin in specific shock.

Of equal importance is the further fact that if the serum of a sensitized guinea-pig or rat is mixed with the antigen in vitro, within two or three minutes thereafter it is possible to demonstrate the presence of anaphylatoxin. The speed of poison production in this case is the same as with trypanosomes, agar, peptone, inulin, etc. Particularly noteworthy is the fact that the addition of distilled water to the serum from a sensitized rat results in an almost instantaneous production of the poison. It should be added that the serum of a normal rat behaves in a similar manner when diluted with distilled water, but the reaction is not as rapid. It follows from these observations that the matrix of the poison is a very labile constituent of the plasma or serum. Its extreme lability is also indicated by the fact that heating of the serum to 50 C. for fifteen minutes diminishes or destroys the matrix, since serum thus heated cannot be toxified by the addition of distilled water.

When the dog is subjected to specific anaphylactic shock, or is injected with peptone, it gives as one of the characteristic responses a noncoagulable blood. Hitherto it has not been possible to produce this condition in the blood of guinea-pigs which have been subjected to specific anaphylactic shock. By drawing the blood from the heart of the shocked guinea-pig into a suitable pipet shortly after the second injection of the antigen, we have been able to obtain it in a perfectly incoagulable condition.

The foregoing facts demonstrate clearly that, in specific shock, anaphylatoxin is produced in vivo; and further, that this poison is produced at about equal speed when the sensitized serum is brought into contact with the antigen in the test tube. The experiments with distilled water, moreover, demonstrate, first, that the poison is not derived from the antigen since no antigen is used, and second, that the poison production is independent of any adsorption reactions since no suspended matter is present. It follows, therefore, that the adsorption theories of anaphylatoxin production, as well as the theory of Friedberger, in which the matrix of the poison is located in the nitrogenous constituents of the antigen, are definitively disproved.

These points having been established, it was of importance to ascertain whether or not the production of anaphylatoxin was associated with protein cleavage. A good indicator of the presence or absence of such cleavage is Van Slyke's method for the determination of aminonitrogen. If cleavage occurred, it was reasonable to expect an increase in aminonitrogen, indicating a liberation of amino-acids from the protein complex. An extensive series of tests with anaphylatoxin, obtained by the action of agar, inulin or of distilled water showed no increase in aminonitrogen; if anything a slight decrease was observed. The production of anaphylatoxin in such tests was very rapid, and apparently reached its maximum within fifteen minutes, after which it persisted in the tube, without increase or decrease, for twenty-four hours or more. Assuming that this method affords an indication of cleavage, it follows that no protein cleavage is demonstrable in connection with anaphylatoxin production.

EXPLANATION OF THE PRODUCTION OF ANAPHYLATOXIN

This brief presentation of the main facts developed in these investigations suffices to show that anaphylatoxin production and specific anaphylaxis rests on an entirely different basis than has hitherto been supposed. The matrix of the poison is always present in the circulating plasma and is also present in normal serum. This matrix must be looked on as being very labile, quite as much as if not more so than the fibrinogen of blood. In the same way that the labile fibrinogen is changed by a catalyzer, commonly called fibrin ferment, into fibrin, so the matrix is converted through the catalyzing action of substances of utmost diversity into anaphylatoxin. The two reactions — blood coagulation and blood toxification — are twin phenomena in which labile substances undergo intramolecular rearrangement resulting in tautomeric modifications; on the one hand, the insoluble fibrin, and on the other, the soluble anaphylatoxin is produced. There is no good reason to believe that fibrin results from a hydrolytic cleavage of fibrinogen; neither is there any evidence to indicate that anaphylatoxin is formed by the hydrolysis of a matrix.

The disturbance which brings about the transformation of the matrix into poison is readily effected by the addition of almost any alien substance to a serum. Thus, bacteria, trypanosomes, organ cells and organ extracts, peptone, agar, starch, inulin, kaolin, silicic acid, barium sulphate, diverse salts, and even distilled water act as inducers or accelerators of this reaction. As to the mode of action of these substances, nothing definite can be said; but it is probable that a dispersion of the matrix precedes the tautomeric change.

The identical reaction may be produced in vivo by the injection of these totally unlike substances into the circulation of an animal. The result is a nonspecific anaphylactic shock. In specific anaphylaxis, *the inducing substance is formed by the interaction of the antigen with its antibody.* It matters not whether this product forms a visible precipitate, as in the precipitin reaction, or whether it remains in solution. It is this formation of a new and alien substance which induces the intramolecular change in the matrix, transforming it into a poison. The specificity of the reaction concerns the production of this catalyzer, and not that of the poison.

To explain the incoagulability of shock blood, it must be assumed that this inducing agent also reacts with fibrinogen, which it transforms into an incoagulable tautomeric modification. Whether or not this new product corresponds to the fibrinoglobulin of Hammarsten cannot be stated. It is obvious, however, that the labile constituents of blood must be subjected to renewed scrutiny, and that the old problem of blood coagulation must be approached from a somewhat different standpoint than has been the case in the past. The theories of immunity are not a safe guide in the study of coagulation; they have certainly proved anything but useful in the study of anaphylaxis. The conception of the formation of an incoagulable tautomer of fibrinogen in anaphylactic shock is also applicable to the puzzling condition of hemophilia. The good effects of serum injection in this condition, though temporary, may be due to a reversive action of the serum, if not to that of the alkali present. It would be of interest to determine the effect of an alkali treatment in such cases.

It may happen in nonspecific shock, as when large doses of rabbit serum, or of distilled water are injected, that the fibrinogen change follows the usual path with thrombosis as a result. The fact that in one case the blood is incoagulable while in another it clots more rapidly than usual does not mean that the reactions are entirely different; the trend of tautomerization is merely varied by the conditions affecting the blood mass. It is perfectly reasonable to believe that fibrinogen is capable of yielding several tautomers, as fibrin, fibrinoglobulin, that coagulated by heat, and perhaps the incoagulable form mentioned. As stated above, the matrix of the poison is very labile, and this fact is suggestive of a possible relation to fibrinogen or to fibrinoglobulin. Like fibrinogen, the matrix is capable of existing in several modifications, the native or plasmic form, the highly toxic type or anaphylatoxin, the inactive or inert form resulting by heating at 50 C., and that which is fully coagulated by heat.

As regards the nature of anaphylatoxin, it is not possible to make any very definite statement. Investigations which are being conducted at present indicate beyond doubt that it is not a simple chemical substance; neither is it a partially hydrolyzed, soluble protein of the type of proteose. Rather, it appears to exist as a larger molecular complex than is that of serum albumin, and, moreover, it possesses certain globulin characteristics.

TARAXIGEN, TARAXIN AND TARAXY

It will be seen that the phenomenon of anaphylatoxin production, which includes anaphylaxis, is not connected with the problem of immunity except so far as it shows the ready response of a labile blood constituent to an alien substance; neither is it the antithesis of protection, as implied in the term "anaphylaxis." The latter and its offshoot anaphylatoxin are clearly misnomers when viewed in the light of these studies. These terms, however, have come into such general use that it is highly probable that they will continue to be employed. Nevertheless, the phenomenon is of such great practical importance that it seems to be worth while to suggest a terminology which will express concretely the results of these investigations. With the kinship to blood coagulation in mind, it is proposed to designate the matrix of the poison as "taraxigen," and its tautomeric poisonous form as "taraxin." The terms[1] recall the similarity in the reaction to that which occurs in coagulation, when fibrinogen is changed to fibrin. "Taraxy" is the disturbed state or condition caused by the poison.

It is important to realize from the medical standpoint that inducing substances may develop within the normal animal through some unrecognized cause which may lie in a peculiarity of diet, or in exposure, or in obscure infections, etc. As a result, the blood of such an animal will be abnormally toxic because of the presence of anaphylatoxin or taraxin. This condition has actually been observed in normal, untreated rabbits. A similar condition without doubt is of frequent occurrence in man, and while the amount of poison thus produced may not be sufficient to cause an acute anaphylactic or taraxic shock, it may lead to a subacute or chronic form of intoxication. The sudden formation of much anaphylatoxin or taraxin may bring on the explosive effects seen in eclampsia, and perhaps in surgical shock, not to mention other attacks with rapid onset. The gradual production and continued presence of such poison may result in the obscure effects noted in connection with some of the so-called autointoxications, and it may lead to anemia, cachexia, etc. Lastly, and not the least, it is also to be remembered that a considerable part of the toxic effects in infectious disease is in all probability due to the formation of anaphylatoxin or taraxin. In other words, infection leads to taraxy. The great and far-reaching importance attaching to this problem will be evident the moment it is realized that the circulating blood, through a variety of agents, may be changed from a beneficial and harmless to an injurious and poisonous state. The alien substance is merely the trigger which, so to speak, ignites or explodes the charge contained within the blood vessels. It will be seen that this point of view opens up a large field of inquiry.

The treatment of taraxy must aim to destroy the anaphylatoxin or taraxin present, and to prevent its further formation. It has been shown that alkali not only destroys but also prevents the formation of this poison in the test tube. This fact appears to furnish a rational basis for the employment of alkali or alkali-producing salts, in the treatment of such conditions. The beneficial effect of alkali administration in acidosis and in shock may consist in bringing about a reversion to the normal tautomeric state of the taraxin present. This may also explain the striking results following the injection of normal serum in hemophilia, and of alkalinized blood in acidosis (Gettler and Lindeman).[2]

The administration of sodium bicarbonate, or preferably sodium acetate in doses of from 3 to 5 gm., dissolved in about half a glass of water, and given at intervals of from half an hour to an hour during the day, has resulted in marked beneficial effect in three severe cases in which chronic taraxy or anaphylatoxic poisoning was believed to exist. These cases were: salvarsan poisoning (Dr. Wile); ascending paralysis (Dr. Camp), and multiple exudative erythema (Dr. Wile).

The immediate object in mind in this treatment was to raise the alkalinity of the blood to *a maximal level and to keep it there* for the duration of the tests. The study of the action of alkali under diverse laboratory

1. The derivation is from the Greek ταραξις, a disturbance.
2. Gettler, A. O., and Lindeman, Edward: A New Method of Acidosis Therapy, THE JOURNAL A. M. A., Feb. 24, 1917, p. 594.

conditions is being continued. It is desirable, however, that the treatment be given an extended trial, not only from the curative but also from the preventive standpoint; the latter is especially advisable, perhaps, in patients showing a tendency to eclampsia and to food poisoning. Furthermore, in special cases of susceptibility to antitoxin or salvarsan injections, the preventive administration of a large dose of alkali or acetate, shortly before such treatment, is advisable.

THE DIAGNOSIS AND TREATMENT OF THE FLAGELLATE DIARRHEAS

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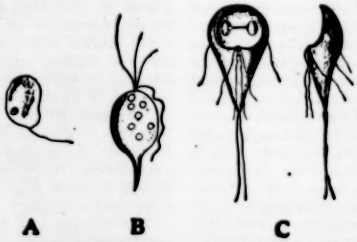
The routine microscopic examination of feces to determine the presence or absence of endamebas and the ova of the various parasitic helminths not infrequently results in the discovery of the presence of certain flagellate protozoa. In many instances, especially in individuals who have been residents for a longer or shorter period of warm climates, these flagellates will be found to be not the only animals parasitic in the intestinal canal, and it follows, therefore, that in such cases the symptoms ordinarily produced by one species of parasite may be overshadowed partially or completely by those produced by another species. Now and then, however, there is encountered a specimen in which the flagellate organisms with which this paper deals are present, but in which no other living pathogenic agent, either protozoal, metazoal, or bacterial, can be discovered. In such cases an opportunity to study the pathologic effects resulting from the presence of these parasites alone is presented.



Flagellates: *A*, Cercomonas hominis Davaine; *B*, Trichomonas intestinalis; *C*, Lamblia intestinalis.

The flagellates concerned are three in number and may be briefly described as follows:

A. *Cercomonas hominis* Davaine.—In form this organism is irregularly round or pearshaped, with the longer diameter measuring in the great majority of individuals from 8 to 10 microns. From the more rounded end there projects a single flagellum, which is in general nearly twice the length of the body. No undulating membrane is present. The nucleus is difficult to distinguish. In preparations of freshly voided intestinal contents examined microscopically the parasite is seen to be actively motile.

B. *Trichomonas intestinalis* Leuckart.—This protozoon is probably identical with *T. vaginalis* Donne, which was originally thought to occur only in vaginal mucus of an acid reaction and to be not transmissible to the human male. It is, like *C. hominis*, somewhat pear shaped, but, unlike *C. hominis*, its smaller extremity is drawn out to a fairly definite and sharp point. It differs also from the previous organism in size, its longer diameter being from 15 to 25 microns, in the possession of an undulating membrane, and in showing at its rounded end three flagella instead of one. The nucleus is quite distinctly visible. In specimens of recently voided feces the parasite manifests active motility.

It may be said here that in the past much confusion in distinguishing these two species has existed and undoubtedly many mistakes in identification have been made.

It is very often the case that the presence of these organisms, if their number is not excessive, excites no symptoms worthy of note. But if the infection is intense, there will probably result a diarrhea of varying severity. In number the fecal evacuations range from three to six per diem. In a great majority of instances the specimens show nothing definitely abnormal except in the matter of consistency, which may be anything from liquid (watery) to semisolid. Only very rarely are cases met with in which the presence of mucus or blood in small amounts gives a dysenteric tint to the picture. So far as is known the parasites never penetrate into the substance of the intestinal wall and definite ulceration has not been observed.

C. *Lamblia intestinalis* R. Blanch.—This third flagellate is also irregularly pear shaped in outline. It is from 10 to 20 microns in length and its greatest breadth, which is near the anterior rounded extremity, is about one half of its length. The cytoplasm is seen to be finely granular and is surrounded by a thin cuticle, by means of which the organism is enabled to maintain a practically permanent form; that is to say, its outline varies by relatively slight changes only. The nucleus is of a dumb-bell shape and is situated in the anterior part of the body. On one side and near the anterior extremity is to be found a rounded excavation, which looks obliquely forward. This excavation is probably a sort of peristome and exercises the functions of a clinging organ. Four pairs of flagella serve to endow the parasite, as seen in freshly passed stools, with an active motility. The first pair of flagella arise from the anterior border of the excavation above described; the second and third pairs, from the posterior edge of the same organ; while the fourth pair take their origin from the posterior pointed extremity, or tail.

There has been in the past much discussion concerning the pathogenicity of *Lamblia intestinalis*, and this has finally resulted in the conviction that it may cause disease. The symptoms may be slight, moderate, or severe, depending on the number of organisms present. By far the most important symptom is diarrhea. In general, the evacuations number from four to eight daily; they are liquid (watery) in consistency and brown in color, and they may contain small amounts of mucus unmixed with fecal substance. Intestinal griping and rectal tenesmus are present only in those very rare cases in which accompanying an intense infection there are some of the signs of a true dysentery, namely, blood and mucus in the stools and a febrile reaction. These parasites are said not to cause definite ulceration of the intestinal mucosa. By means of their peristome-like organ they attach themselves to the superficial layer of epithelium and it is probable that the mechanical irritation resulting therefrom is responsible for the production of the diarrheal manifestations.

REPORTS OF CASES

CASE 1.—M. B., a white woman, aged 51, married, occupied as a house servant, had a family history negative with reference to her present illness. Her history previous to the present illness was incompletely determined. The patient

stated only that she had had diarrhea with passage of some mucus during several months immediately preceding.

The present illness was first seen July 12, 1910, when the patient was admitted to the medical wards of the New York Post-Graduate Hospital. She made complaint of diarrhea and indigestion. The patient was having from two to five semisolid stools daily, in a certain number of which mucus in small amounts was to be found. Microscopic examination of the feces on July 15 revealed the presence of the vegetative forms of *L. intestinalis* in large numbers. The essential feature of the treatment which was at once entered on was high irrigation of the colon with a solution of methylthionin hydrochlorid of strength 1 to 3,000 (methylthionin hydrochlorid is methylene-blue). It is at present not possible to determine from the history of this case the results of the later microscopic examinations of the feces, but following the amelioration of the symptoms, including a return of the stools to a condition of normal consistency, the patient was discharged July 27.

This same patient was again admitted to hospital April 22, 1912, with complaint only of intestinal parasites. At this time she was having from one to three semisolid stools daily. Defecation was not accompanied by pain. No other symptoms were complained of. Microscopic examination of the feces on April 23 showed encysted *L. intestinalis* in large numbers. The treatment which was immediately instituted consisted of high colonic irrigations with normal saline solution and the daily administration by mouth of ipecac in massive but decreasing doses. Seventy grains were given at one dose the first day and each succeeding day's dose was diminished by ten grains. After two days of this treatment only a very few organisms could be found in the feces. The patient was discharged April 30 in an apparently normal condition.

CASE 2.—T. T., a white man, aged 51, married, occupied as a laborer, had a family history negative with reference to the present illness. At one period previous to the present illness he had practically constant pain in the lumbar region. This symptom had been absent for several months previous to admission. He suffered one attack of pronounced jaundice in early manhood. He received a blow on the head in 1898, which rendered him unconscious for a few minutes. He had gonorrhea twice as a young man, but he denied syphilis. He had been constipated for a few months previous to the present illness. Until two years previous to admission the patient had been accustomed to drink beer every day and whisky occasionally. But he had given up alcoholic beverages entirely. He used tobacco immoderately, and drank six cups of tea daily. During the year immediately preceding admission to hospital the patient had three seizures, which, judging from his own account, were probably epileptiform in character.

In his present illness the patient was first seen June 24, 1912. The complaint was of weakness and shortness of breath on exertion. The patient stated that he usually vomited once daily, generally after breakfast, but occasionally after supper. He was very nervous. He was having from two to five evacuations of the colon daily, the stools being liquid or semisolid. Microscopic examination of a specimen resulted in finding great numbers of *L. intestinalis*. The patient was given first a calomel purge followed by a saline. One week thereafter daily colonic irrigations with solution of quinin sulphate of strength 1 to 5,000 were instituted. At the end of another week the parasites were still very numerous. Two days later the parasites were reduced in number. At this time the general symptoms were much improved and the patient was discharged.

CASE 3.—S. M., white man, aged 22, unmarried, a soldier by occupation, with a negative family history with reference to present illness, had had the usual diseases of childhood. For the past year and a half the patient had suffered with mild digestive disturbances, such as continued gaseous fermentation and intermittent attacks of pyrosis and abdominal distress. The last-mentioned symptom manifested itself about one hour after eating. There was neither loss of appetite nor apparent decrease in weight. Defecation occurred quite regularly twice daily, exceptionally once or three times a day. The stools were described as being usually semisolid, but the act of defecation was never accompanied by pain. The patient stated that he indulged very rarely in alcoholic beverages, and never to excess.

In his present illness he was first seen Dec. 12, 1915. At that time he complained of moderate diffuse epigastric distress, which manifested itself about one hour after each meal, pyrosis, and a bloated condition of the abdomen. Physical examination showed a well-nourished and muscular youth, slightly below medium height. No abnormalities of the thorax and contained organs or of the abdomen and contained organs could be discovered by the ordinary methods of physical examination. The urine was normal. The feces were semisolid and contained *C. hominis* in large numbers, but were otherwise normal.

In treatment the patient was given methylthionin hydrochlorid (methylene-blue) in 2-grain doses four times daily by mouth, and in addition a daily enema, which was retained for ten minutes, of a 1 to 1,500 solution of the same drug. At the end of one week the organisms had disappeared from the feces and the subjective symptoms of which the patient originally complained were much ameliorated. The stools, however, were still semisolid. After another week of similar treatment a still more marked improvement in the symptoms was evident and the stools were manifesting a tendency to be formed. At this time the patient was lost sight of as a result of his being discharged from the army.

CASE 4.—C. M., a white man, aged 42, married, a lawyer by occupation, had a family history which was negative with reference to the present illness. He stated that he had incipient tuberculosis at left apex several years ago. This had been healed for at least fifteen years. He had typhoid fever in 1893. He says he had fever and diarrhea while in Panama in 1895. He had dysentery while in camp at Chickamauga in 1898, and a severe attack of bloody dysentery in 1907, during a residence in Brazil, since which illness the patient has suffered continuously from constipation and diarrhea in alternation. During the course of an appendectomy in 1912 a mass of adhesions about the gallbladder and duodenum was discovered. A diagnosis of gastric ulcer had been previously made, but was not confirmed at this operation. The patient had had digestive disturbances for ten years.

In his present illness he was first seen March 15, 1915. At that time the patient complained of gas in the stomach, flatulency and pyrosis. The administration of magnesia relieved these symptoms temporarily. Insomnia and nervous tension were distressing features of the condition, as stated by the patient. The appetite was good, but the patient refrained from satisfying it on account of the fear of epigastric distress, which always appeared about an hour after meals and persisted until the next time food was taken. The patient also awoke frequently at night suffering from a distressed sensation in the epigastrium. Physical examination showed a man 6 feet 1 inch in height, whose weight was considerably below normal, being only 130 pounds. Auscultation revealed the presence of a few crepitant râles at the left apex. Percussion showed the stomach to be moderately dilated and ptosed, the fundus reaching to a point 2 inches below the level of the umbilicus. Otherwise the physical examination of the thorax and abdomen was negative. An Ewald test breakfast yielded 110 c.c. of gastric contents, in which was much mucus. The free hydrochloric acid was 56, combined hydrochloric acid 20, total acidity 84. Indican was present in slight excess in the urine, which also contained a faint trace of albumin. The blood was negative for malarial parasites. The intestinal contents were semisolid; they contained *C. hominis* in enormous numbers and an excessive bacterial flora; otherwise they were normal.

At this time the patient was given methylthionin hydrochlorid (Merck's medicinal methylene-blue) in 2-grain doses every three hours by mouth. He was also given once daily an enema consisting of 500 c.c. of a 1 to 1,000 solution of the same drug, the enema being retained for fifteen minutes. The strength of this enema was gradually increased until

finally it contained the medicinal agent in the proportion of 1 to 250. This treatment was continued for sixteen days, at the end of which period examination of the feces showed a practically normal stool, in which were found neither animal parasites nor ova.

On June 17, 1915, the patient was seen again. At that time he had gained seventeen pounds in weight after treatment was first instituted. He still complained of gas in the stomach and intestines, especially in the evening. The bowels were regular in their activity.

On Sept. 10, 1915, the patient again presented himself, saying that for the past five days he had been suffering from digestive disturbance, excessive gas in the stomach, loss of appetite, restlessness, constant peristalsis, and diarrhea. Up to the day of the onset of these symptoms the general health had been excellent and a total gain in weight of thirty pounds had been recorded. Examination of a stool showed that it consisted largely of blood and mucus and contained *C. hominis* in enormous numbers. Treatment with methylthionin hydrochlorid was again instituted and at the end of five days the parasites had entirely disappeared. A great improvement in the gastro-intestinal symptoms was also manifest.

In May, 1916, the patient had a return of his gastric symptoms, due to several months of mental strain and improper food. Although he presented no symptoms referable to the intestines, a few of the *C. hominis* were found in the feces. They were not present in sufficient numbers to be pathogenic. After giving retaining enemas of 500 c.c. of 1 to 500 methylthionin hydrochlorid on four successive days, the stools were found to be free of parasites.

Case 5.—A. T., white man, aged 23, unmarried, resident of Persia until he came to the United States thirty-three months ago, was seen in March, 1916, through the courtesy of Dr. Max Einhorn. For the preceding year the patient had symptoms of ulcer of the pylorus. This diagnosis was subsequently confirmed by an operation. For two weeks previous to his admission to the hospital he had had from three to six watery stools daily. The movements were accompanied by marked rectal pain. There had been no previous history of diarrhea. The feces were fluid, containing some mucus and large numbers of *C. hominis*. He was given 4 grains methylthionin hydrochlorid by mouth three times a day and a daily enema of 1 to 500 of the same substance. In May repeated examinations of the feces found them to be free of the parasites.

Case 6.—G. H., white man, aged 42, married, shoe cutter by occupation, born in the United States, never having been out of the north eastern states, was admitted to the hospital suffering from advanced diabetes. He had never had any symptoms referable to the gastro-enteric tract. On May 24, 1916, his feces contained a moderate number of motile *L. intestinalis*, with several encysted lamblia. These parasites did not produce any symptoms. After four retaining enemas of 1 to 500 of methylthionin hydrochlorid given on consecutive days the feces were found to be free of intestinal parasites.

An accurate diagnosis of these conditions has as its only possible basis a microscopic examination of the intestinal contents. A drop of emulsified feces is placed on a warm slide, covered with a No. 1 cover glass, and examined under the high dry objective. The active movements of these organisms, which are entirely different in character from those of amebas, will quickly, easily and surely call attention to their presence. Specific determination can then be made by further study of individual specimens under the oil immersion objective, bearing in mind, of course, the morphologic characteristics hereinbefore described.

A careful and comparative study of the foregoing cases has led us to certain conclusions, which may well be emphasized. In view of the etiologic factors which we have described, it will without doubt be readily accepted that the ordinary methods of treatment which are employed in cases presenting similar symptoms, but which are of nonspecific causation, will be of little avail if made use of in the flagellate diarrheas. As a matter of fact, bismuth and opium and all similar combinations of astringents and opiates are well-nigh useless in the therapeusis of these conditions. On the other hand, however, it is a fact which should not be lost sight of that merely putting these patients at rest in bed is often followed by a disappearance of the parasites and an improvement in the character of the fecal discharges. This does not constitute a cure, for within a certain length of time after such a patient has resumed his normal activities he will almost surely suffer a relapse.

The best therapeutic measure available in the treatment of infection with any one of these parasites we believe to be the administration, both by mouth and in the form of high enemas, of Merck's medicinal methylene-blue, the chemical name of which is methylthionin hydrochlorid. It is essential that only the medicinally pure drug should be used, as the methylene-blue ordinarily employed in laboratory staining solutions contains traces of zinc. Patients in whose cases this treatment is instituted should be warned that during the process of elimination of the therapeutic agent the urine will be blue in color. It may be remembered that two of the earlier cases in this series were not cured by the use of methylene-blue. In our opinion this was due to the fact that by no means enough of the drug was exhibited. It is now our custom to give 2 grains every three hours by mouth and to administer at least once and preferably twice a day a high enema, which should be retained for fifteen minutes, consisting of 500 c.c. of an aqueous solution of the drug, the strength of which is to be between 1 to 500 and 1 to 200. The excellent results which are thus attainable, even in the severest and most persistent cases, are well illustrated by our Case 4. In this connection, however, it must be said that methylene-blue seems to have much less of a specific action on trichomonas and lamblia than it exerts on cercomonas, which was the causative organism in Case 4. On the other hand methylene-blue is, as far as we know, the only drug which manifests any appreciable effect at all on either trichomonas or lamblia. Ipecac and its alkaloids, if of any value whatever, certainly do not possess the same parasiticidal effect that they exhibit in their action on amebas.

The fact that these organisms are probably transmitted through the medium of drinking water and of fresh vegetables which are eaten uncooked after being previously fertilized with human excrement suggests the available methods of prophylaxis. All drinking water which is not entirely above suspicion of fecal contamination should be efficiently sterilized before use. The same of course applies to all water which is taken into the mouth in cleansing the teeth or for other purposes. Similarly, the use of vegetables, tubers, and fruits usually eaten uncooked which come from truck gardens where it is customary to use human fecal material as fertilizer should be discontinued, or if such articles of food are used at all, they should be thoroughly cooked.

In conclusion it is desired to call attention to the increasing frequency with which infection of the alimentary tract with protozoal parasites (of other genera in addition to those with which this paper deals) is being encountered in the temperate portions of the United States. This probably results in large part

from the increasing intimacy of communication between this country and those tropical localities where the parasites referred to and the pathologic conditions which they produce have been long prevalent. It is probably not generally known, for example, that amebic dysentery has been reported from some thirty-five of the states which compose this country.

Balantidic dysentery is also encountered at intervals. These diseases in temperate climates do not in most cases present the severe symptoms which characterize them when met with in the tropics. Thus, amebic dysentery rarely manifests itself as a true acute dysentery, but rather as a chronic and painless, but persistent diarrhea, in which the stools may at times contain small amounts of blood and mucus. In some sense this chronicity, which we observe in so large a proportion of these cases in this country, is a distinctly unfavorable factor, in that patients often do not seek medical attention until, following the slowly progressive decline in general health which results from the protozoal infection, they fall victims to acute intercurrent diseases, which not infrequently in such instances result at least in needless sacrifices of life. Under these circumstances the symptoms resulting from the superadded acute infection overshadow completely or in part those of the preexisting chronic infection, and the latter is never diagnosed.

That any cases similar to those described should ever be allowed to progress as far as they often do without receiving proper treatment is a pity, but until the microscopic examination of the stools of all patients from whom even the vaguest history of gastrointestinal disturbances can be obtained becomes as much a matter of routine as the chemical examination of the urine, no decrease in the number of such cases can be expected, at least in those localities in which failure to accord proper treatment to the water supply prior to its distribution makes it impossible to guarantee its purity and in which the unsanitary system of fertilizing growing vegetables with human feces is in vogue. Those cases which we have here reported and those of amebic dysentery which we have encountered in increasing numbers during the last two years have served to deepen in us the conviction that it is nothing short of a duty on the part of our medical schools to give more attention than most of them at present do to the protozoal infections with which this paper concerns itself, to the end that, isolated and relatively infrequent though the cases may be in the northern and western states, they may yet be recognized and efficiently treated when they do occur, before there has been brought about so great a decrease in the general vitality as to render destruction of life the probable outcome of an acute bacterial infection from which the individual might otherwise be reasonably expected to recover.

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False Teeth Five Years in Alimentary Canal.—The *Gazeta Medica da Bahia* relates that the Roentgen rays showed the set of false teeth in the esophagus soon after they had been swallowed. Attempts to extract the foreign body failed and the patient refused to permit an operation, but the foreign body was inspected from time to time with the screen. After two years in the esophagus it passed into the stomach where it remained three years. It caused no appreciable disturbance at any time except slight discomfort as the food passed the foreign body in the esophagus, and later when the stomach was empty. At the end of the fifth year it passed on into the bowel and was then soon expelled. The man ate the usual diet throughout.

AN ANTIPOLIOMYELITIS HORSE SERUM

PRELIMINARY REPORT *

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The question of the production of a horse serum that will have protective and curative properties against the virus of poliomyelitis has occupied the attention of many investigators. So far as we can discover no one has reported the discovery of a horse serum that will either neutralize the virus in vitro or protect an animal against the virus of poliomyelitis. Flexner,[1] who was the first to attempt to produce an immune horse serum, reports:

> It has, for instance, been found that the horse does not readily respond even to large injections of filtrates carrying the active virus with the development of immunity principles within the blood. It is true that our experiments are restricted for the present to a single horse, the blood serum of which, after many months of treatment, had no restraining effect on the virus either in vitro or within the body.

From all the experimental and clinical data at hand it seems to be fairly probable that the exotoxin of the germ is of a negligible quantity and intensiveness. The destructive action of the virus seems to be due to the virulence of the germ and its ability to multiply rapidly. It seemed feasible to us, therefore, to inoculate a horse with the poliomyelitis endotoxin, if recoverable, on the theory that it might potentially immunize the animal, and then continue with injections of filtrates containing the germ.

Since cultural methods so far devised by Flexner and Noguchi are impracticable to obtain any exotoxin or endotoxin, we have attempted to obtain the endotoxin by digesting the germ in the filtrate of a brain and cord emulsion with a proteolytic ferment. For this purpose we have used trypsin made for us by Fairchild Brothers and Foster in 10 per cent. glycerin solution. Although we had no demonstrable evidence that the endotoxin was obtained, we nevertheless proceeded to prepare, in a manner indicated below, the filtrates of emulsions of cords and brains of children who had died of poliomyelitis, and injected our horse as follows:

Aug. 31, 1916, a sterile filtrate—through a Heim filter—of a 10 per cent. emulsion of human brain and cord was obtained, and 60 c.c. were mixed with 2 c.c. of the Fairchild trypsin solution and incubated for three hours at 36 C., and 0.4 per cent. tricresol added after the three hours' incubation, so as to stop the further action of the trypsin. Previous to the addition of trypsin we found the filtrate to be slightly alkaline to litmus paper. Some of the trypsin solution used was always inoculated into ascitic broth and ascitic agar, and found sterile after several days' incubation.

September 5, 5 c.c. of the trypsinized filtrate were diluted to 50 c.c. with physiologic sodium chlorid solution and injected into the horse in five different places (lower neck and shoulder blade), 10 c.c. to each place. September 8, 8 c.c. diluted as above, were injected in five places; September 11, 15 c.c., and September 14, 20 c.c.

A second lot of filtrate of 100 c.c. was treated as the first, and injections continued as before: September 17, 25 c.c.; September 20, 30 c.c., and September 23, 40 c.c.

* From the Research Laboratories, Department of Health, City of New York, Dr. William H. Park, director.

1. Flexner, Simon: The Contribution of Experimental to Human Poliomyelitis, THE JOURNAL A. M. A., Sept. 24, 1910, p. 1112.

A third lot of 500 c.c. was prepared with trypsin in the proportion of 1 trypsin to 50 filtrate and incubated for one hour at 36 C., and then 0.4 per cent. tricresol added. Of this we injected, September 26, 50 c.c., without diluting any further; September 29, 60 c.c.; October 2, 75 c.c.; October 5, 85 c.c., and October 8, 100 c.c.

A fourth lot of 1,300 c.c. of filtrate was prepared with trypsin in the proportion of 1:100 and incubated for one hour at 36 C. and 0.4 per cent. tricresol added. Through unavoidable delay in its preparation we were not able to inject the horse for about two weeks after the last injection. Of this lot we injected: October 21, 125 c.c.; October 24, 150 c.c.; October 27, 175 c.c.; October 30, 200 c.c.; November 2, 225 c.c., and November 5, 250 c.c.

A fifth lot of 1,200 c.c. of filtrate of a 20 per cent. emulsion was treated as the fourth lot with trypsin and tricresol, and injected as follows: November 8, 175 c.c.; November 11, 200 c.c.; November 14, 225 c.c., and November 17, 225 c.c.

Injections were now discontinued for a trial bleeding. Nov. 23, 1916, the horse was bled, and we received 1,200 c.c. of serum. This we passed through a Berkefeld filter, inoculated some of it into ascitic broth and ascitic agar, and, after finding it sterile after several days' incubation, added to it chloroform as a preservative and used it for our experiments. We might mention that the condition of the horse throughout the treatment was apparently normal.

Jan. 10, 1917, we prepared a 5 per cent. emulsion of the cord and brain of monkeys infected and brought down with a very potent virus of poliomyelitis, which we obtained from the Rockefeller institute through the courtesy of Dr. Amoss. This suspension we filtered through sterile paper pulp and added to it 0.4 per cent. tricresol, and without adding any trypsin, we continued to inject the horse as follows: January 18, 50 c.c.; January 20, 75 c.c.; January 22, 100 c.c.; January 24, 125 c.c.; January 26, 150 c.c.; January 28, 175 c.c.; January 30, 200 c.c.; February 1, 225 c.c.; February 3, 250 c.c.; February 5, 275 c.c., and February 7, 300 c.c.

January 22, after the third injection with the filtered suspension of the monkey virus, the temperature of the horse rose to 103.4 F. seven hours after the injection, and subsided within twenty-four hours. After each injection thereafter the temperature would rise and subside within twenty-four or thirty-six hours. February 9, the horse was unable to stand up, and his temperature was subnormal. No further injection was attempted. He then received a saline infusion of a temperature of 105 F., February 10, in the forenoon, and after he had recovered somewhat, about 4 liters of blood were withdrawn.

The horse died on the afternoon of the same day. The necropsy revealed some congestion of the lungs, the other viscera being normal. Microscopically there were no cord changes.

PROTOCOL OF EXPERIMENTS WITH THE SERUM

Experiment 1.—Dec. 6, 1916, Monkey 3 (mangabey) was injected intracerebrally with 0.5 c.c. of a 5 per cent. suspension of an eighth generation monkey virus, and at the same time 20 c.c. of the serum intramuscularly. Twenty-four hours afterward, daily injections were begun of 3 c.c. of the serum intraspinally and 17 c.c. intramuscularly. These were given for seven days, when it was considered wise to cease treatment. The animal remained well up to December 17, four days after the last treatment, when it seemed ill at ease. December 18, the right extensor cruris was weak. On this day he received 3 c.c. of the serum intraspinally and 17 c.c. intramuscularly. December 19, he seemed to favor the left leg also. On this day and the following he received 3 c.c. of the serum intraspinally and 17 c.c. subcutaneously. The animal began to improve in the afternoon of December 19, and on January 7 was completely well and continues well today, four months after the inoculation.

Control.—On the same day Monkey 2 (*Macacus rhesus*) was injected intracerebrally with 0.5 c.c. of the same suspension of the same virus. This animal died in convulsions within six days and six hours. Histopathologic lesions were characteristic of poliomyelitis.

Experiment 2.—Monkey 4 (mangabey), baby of Monkey 3, was injected intracerebrally, Dec. 31, 1916, with 0.9 c.c. of a mixture prepared as follows: Through the courtesy of Dr. Amoss we received from the Rockefeller Institute the cord of a monkey that died, Dec. 29, 1916, infected with a very potent virus, of which 0.2 c.c. of a 5 per cent. suspension proved a fatal dose. Three-tenths c.c. of a 5 per cent. suspension of this cord was mixed with 0.6 c.c. of the serum and incubated for two hours at 37 C. and left in the refrigerator for twenty-two hours. This entire mixture was injected into the small animal. It has remained well ever since.

Experiment 3.—Monkey 6 (rhesus) was injected, Jan. 4, 1917, intracerebrally with 0.5 c.c. of a 5 per cent. suspension of the Rockefeller virus. Forty-eight hours after the injection, the left forepaw was paretic. On this day, January 6, it received 3 c.c. of the serum intraspinally and 15 c.c. intramuscularly; January 7, 3 c.c. intraspinally and 15 c.c. intramuscularly; January 8, 4 c.c. intraspinally and 27 c.c. intramuscularly, and January 9, 2 c.c. intraspinally. The animal was very ill, January 8, refused food, and was lying on the floor of the cage; occasionally it sat up, with the right foreleg paralyzed; later in the day both forelegs became completely paralyzed, the muscles of the neck were involved, and the animal was unable to swallow. Both hind legs were in good condition. January 9, all four limbs were paralyzed, and the animal was unable to take food. The animal died, January 10, at 4 a. m. Macroscopic and microscopic findings were characteristic of poliomyelitis.

Normal Horse Serum Control for Monkeys 4 and 6.—Monkey 5 (rhesus) was injected, January 4, intracerebrally with 0.5 c.c. of the same suspension of the Rockefeller virus. Forty-eight hours after the inoculation, we began treating it with normal horse serum in the same manner as Monkey 6, with daily injections of 3 c.c. intraspinally and 17 c.c. intramuscularly. It became weak in the hind limbs two days after the virus inoculation, and was totally paralyzed in the legs on the fifth day. It was killed, and the macroscopic and microscopic findings were characteristic of poliomyelitis.

Experiment 4.—Monkey 7 (rhesus), Jan. 12, 1917, was injected intracerebrally with 0.9 c.c. of the following mixture: Three-tenths c.c. of a 5 per cent. suspension of the cord and brain of Monkey 5 was mixed with 0.6 c.c. of the serum and incubated for two hours at 37 C. and then left in the refrigerator for twenty-two hours. The animal remained well till January 18 at 4 p. m., when it seemed rather ill, preferring to lie on the floor of the cage. The following day it seemed to have improved generally, but was totally blind. The left pupil near the site of the injection was markedly dilated, and neither of the pupils responded to the stimulus of light. From the wound and also from the right nostril oozed a mucopurulent discharge. The animal ate and drank heartily, but was very warm. January 21, it was entirely well and walked about, but carefully searched its place like a blind animal; it was entirely comfortable and ate well, but remained blind. The high temperature was gone. The examination of the fundi oculi revealed a double postneuritic optic atrophy. The monkey was chloroformed, January 22, and examined at necropsy. Microscopically there was a purulent meningitis of the entire cerebrospinal axis. A streptococcus was isolated from all parts of the brain and cord. There was no evidence of a poliomyelitis lesion anywhere.

Experiment 5.—Monkey 8 (*Macacus rhesus*) was injected intracerebrally, Jan. 19, 1917, with 0.15 c.c. of a 5 per cent. suspension of the brain and cord of Monkey 6, and fifty minutes later it received 3 c.c. of the serum intraspinally and 17 c.c. intramuscularly, and a like treatment daily up to and including January 25, which makes a total of seven injections. The animal being perfectly well, January 26, we concluded to cease treatment. January 27, however, it appeared restless, so we gave it 3 c.c. of the serum intraspinally and 15 c.c. intramuscularly. The monkey was perfectly well on the evening of that day and also on the morning of the following day. In the afternoon it suddenly became paralyzed in all extremities and was unable even to swallow water. It was at once chloroformed and examined. Lesions in the cord and brain stem were characteristic of poliomyelitis.

Control for Monkey 8.—Monkey 14 (rhesus), Jan. 19, 1917, was injected intracerebrally with 0.15 c.c. of the same suspension as Monkey 8. This animal had received injections of an emulsion of cord and brain of a child that died of poliomyelitis, but remained well. January 24, five days after our inoculation, it became paralyzed in the left forearm and favored the right leg. January 26, it was paralyzed in the left forearm and weak in the left leg. January 28, it was paralyzed all over and in a dying condition. The necropsy showed characteristic lesions of poliomyelitis.

EXPERIMENT 6.—Monkey 9 (*Macacus rhesus*) was injected intracerebrally, March 3, 1917, with the following mixture: Two-tenths c.c. of a 5 per cent. suspension of a very potent Rockefeller virus No. 88, which we passed through ten generations, was mixed with 0.8 c.c. of the serum of the second bleeding, and incubated at 37 C. for two hours and left in the refrigerator for twenty-two hours. The animal never showed any ill effects, and is perfectly well today, four weeks after inoculation.

EXPERIMENT 7.—Monkey 93 (rhesus) was injected intracerebrally, April 13, 1917, with 0.4 c.c. of the following mixture: Equal parts of the serum of the second lot and a 5 per cent. suspension of the Rockefeller virus were mixed and incubated at 37 C. for two hours, and then left in the refrigerator for twenty-two hours. The animal was not ill at any time, and is perfectly well now, four weeks after the injection.

EXPERIMENT 8.—Monkey 100 (rhesus) was injected intracerebrally, April 25, 1917, with 0.3 c.c. of the following mixture: One part of the serum of the second lot and two parts of a 5 per cent. suspension of the Rockefeller virus were incubated at 37 C. for two hours, and then kept in a refrigerator for twenty-two hours. The animal was well up to May 2, when it appeared ill, sitting in the corner of the cage with its head down. On being approached, it would stand up and be quite active. It continued in this mood until May 5, but on that day it refused food. At no time was it paralyzed or even weak in any limb. The wound at the site of injection never healed. May 6, eleven days after the injection, it was found dead. The necropsy revealed a marked congestion of the vessels of the brain; the other viscera were normal. Microscopically there was no evidence of any lesion of poliomyelitis. The cord was found perfectly normal.

Control for Monkeys 9, 93 and 100.—Monkey 11 (rhesus) was injected intracerebrally, May 5, with 0.3 c.c. of the same suspension of the Rockefeller virus. May 9, the animal was ill. May 11, the hind legs were paralyzed.

SUMMARY

The five neutralization experiments were positive without exception. The serum protected one monkey completely against a rather slowly acting virus, of the eighth generation, originally recovered from a human patient. The experiment in Monkey 6 was rather severe, to use Dr. Park's phrase, since two and one half fatal doses of a most virulent virus were injected and the treatment with the serum was begun forty-eight hours after inoculation, when a paresis was already evident, and the case terminated as a bulbar one. The experiment in Monkey 8 was perhaps less severe, but although the time of the paralysis was delayed by two days over the control, which was somewhat immunized some months previously, the experiment was a negative one.

On account of the scarcity of monkeys we could not make as many experiments as we would wish to, so we report the facts without drawing any conclusions. We feel, however, that we are justified in using the serum in human cases especially when human serum is unobtainable, and shall report when a sufficient number have been treated.

1215 Park Avenue—Foot of East Sixteenth Street.

ACTION OF BACTERIA AND DRESSING SOLUTIONS ON CATGUT LIGATURES

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The durability of catgut in suppurating wounds is of importance chiefly in connection with the use of ligatures for hemostasis. Secondary hemorrhage is a frequent complication of shell and rifle ball wounds, and is a cause of a considerable portion of the deaths and amputations among these patients in many base hospitals. When not caused by a low clotting index of the blood (which is of rare occurrence), hemorrhages of this character are generally due to one of the following factors:

1. Loosening of the fibrin plug in the injured vessel.
2. Erosin or softening of the vessel wall by mechanical means, such as drainage tubes or fragments of bone, by the digestive action of infective organisms, such as the gas bacillus, or by the dressing solution employed in the treatment of the wound.
3. Breaking or slipping of the ligature which closes some important vessel.

It is my intention in this paper to deal only with the failure of the ligature.

There are two things to be investigated in this connection: first, the effect of certain infective organisms, which, in the process of their growth, may attack and erode the catgut; second, the effect of various dressing solutions which might weaken the catgut or cause the slipping of the knot.

ACTION OF BACTERIA

To obtain some information on this point, Mr. H. Larcher of this laboratory has carried out the following experiments:

Chromic catgut No. 0 and No. 1, and plain catgut No. 0 and No 1 were used throughout.[1] A number of pieces of each, of approximately the same length, were dropped into forty-eight hour meat cultures of the *B. aerogenes-capsulatus*, the *B. malignans-oedematis*, the Hibler bacillus, *Streptococcus pyogenes*, *Staphylococcus aureus*, the *B. pyocyaneus*, the *B. proteus*, and the *B. lactis-aerogenes*. Each culture was incubated, and the condition and tensile strength of the catgut examined from time to time and compared with controls.

The results showed no material alteration in the strength or elasticity of the catgut after seventy-two hours of incubation in any of the cultures with the exception of that of the gas bacillus. In this case a very active digestion of the catgut consistently occurred—noticeable after forty-eight hours and progressing rapidly from that time on. After seventy-two hours' incubation, the strength of both No. 0 chromic and plain catgut was greatly diminished, and within four days they were frequently eroded through. All four sizes were almost completely digested by the seventh day, only a few fragments remaining. As may be expected, the small sized catgut was eroded more quickly than the large. The chromic catgut appeared to be eroded, if anything, more rapidly than the plain. The accompanying illustration shows the condition of the catgut from one tube incubated with the gas bacillus as compared with controls of the same sizes.

1. The plain gut was that made by Messrs. Johnson & Johnson, the chromic that made by Triollet.

EFFECT OF VARIOUS ANTISEPTICS

Pieces of the same sizes and qualities of catgut as used in the previous experiment were tied together by a double surgical knot and incubated in one of the following solutions: neutral solution of chlorinated soda, Carrel-Dakin; betanaphthol, 0.5 per cent. solution in 0.1 per cent. sodium hydroxid; sodium hydroxid solution, 1 per cent.; mercuric chlorid, 1:10,000; phenol (carbolic acid), 1 per cent.; sodium chlorid, 5 per cent.; sodium chlorid, 0.87 per cent.; acetic acid, 1 per cent.; sodium perborate, 1 per cent., and distilled water. After three days the pieces of catgut were removed from each tube, examined and measured. The percentage of shrinkage was noted and the tensile strength then tested by adding weights to a hook attached by a loop to the lower end of the ligature. Half a minute was allowed between the addition of each pound weight in order to measure the stretching of the catgut before the break occurred. It was expected that considerable alteration in the tensile strength and the elasticity of the catgut might result from treatment with some of the solutions. Both, however, remained consistently within a slight limit of variation, as did also the shrinkage of the catgut and the stretching which it would bear before breaking. In both controls and treated specimens:

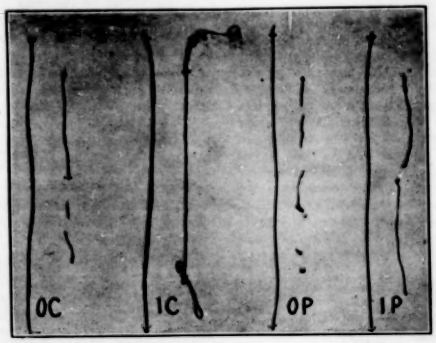
No. 0 chromic catgut withstood a weight of 4 to 5 pounds.

No. 0 plain catgut withstood a weight of 2 to 3 pounds.

No. 1 chromic catgut withstood a weight of 6 to 8 pounds.

No. 1 plain catgut withstood a weight of 4 to 5 pounds.

The chromic catgut, both sizes, showed a shrinkage of about 4 per cent. of its original length as a result of treatment, the plain catgut an average of from 2 to 3 per cent. As is to be expected from its greater strength, the chromic catgut allowed of a greater degree of stretching before breaking, averaging from 20 to 25 per cent. of its length before treatment, while the plain catgut averaged from 15 to 18 per cent., the small sizes of each being usually represented by the lower figure.



Action of the gas bacillus on catgut: *0* and *1* refer to size; *P*, plain; *C*, chromic.

One very important point was observed. It was found impossible to test the tensile strength of the pieces of catgut containing a surgical knot which were in the neutral solution of chlorinated soda, because in every case the knot slipped on the addition of a weight below 2½ ounces. A treble and quadruple knot failed to prevent this result, and the tensile strength and stretching were therefore estimated on pieces of catgut without knots. This slipping of the surgical knot was also noticed occasionally in the case of the acetic dressing and the sodium perborate dressing. With both the latter solutions about one in ten showed slipping of the knot before the catgut broke, but usually after the addition of a weight of several pounds. This slipping of the knot in the case of the neutral solution of chlorinated soda was evidently due to a slimy deposit which invariably occurred, and catgut bathed in the solution for even so short a time as fifteen minutes usually failed to hold a weight of 1 pound.

It is possible that this effect of the neutral solution of chlorinated soda on ligatures (of catgut) may be responsible for the frequency of secondary hemorrhages occurring under this treatment, as well as the loosening of the fibrin plugs thrombosing the injured vessels and the softening of the arterial wall to which it is usually ascribed. That the slipping of the surgical knot is due to the hypochlorite present in the solution, and not to the fact that it is a strongly alkaline solution, is suggested by the fact that the solution of sodium hydroxid and the betanaphthol dressing (the latter of which is approximately of the same alkalinity as the neutral solution of chlorinated soda) did not produce this effect.

The other factor in the failure of ligatures which was observed in these experiments was the erosive action of the gas bacillus on them. This bacillus is also a frequent cause of hemorrhage, through its digestive action on the muscle of the arterial walls. The neutral solution of chlorinated soda possesses a very low bactericidal value against the gas bacillus, and favors in addition the other chief causes of arterial escape, namely, the loosening of fibrin plugs and the softening of the vessel walls. Thus, in a wound infected by the gas bacillus and treated with hypochlorite solutions, all the factors combine to favor hemorrhage.

SUMMARY

Among the species of bacteria considered in these experiments, only one, the *B. aerogenes-capsulatus* of Welch, attacked and eroded catgut ligatures.

None of the dressing solutions tested altered the tensile strength or elasticity of the catgut. One solution, the neutral solution of chlorinated soda, invariably caused slipping of the surgical knot.

The neutral solution of chlorinated soda would appear, from the experimental evidence, to be contraindicated in cases in which important blood vessels are exposed in the wound, and especially if such a wound shows an active infection by the gas bacillus.

6, rue Piccini, Paris (XVIe).

Tell the Patient.—Before the discovery of the fact that tuberculosis is a communicable disease there was greater reason for keeping the diagnosis secret. Before its curability was established it was a serious thing to tell an individual that he had tuberculosis, for it meant the pronouncing of his death sentence. Today the withholding of this information pronounces the death sentence, not only on the afflicted, but also on some of his friends and dear ones.—S. J. Deehan, M.D., *Monthly Bulletin*, Philadelphia Department of Public Health and Charities.

POLIOMYELITIS

SOME FEATURES IN CITY PREVALENCE

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HISTORY

The wave of infantile paralysis of 1916 appears to have been the crest of a prevalence curve which has been increasing in height since 1907, in which year the city of New York experienced an epidemic of 2,500 cases. This was the first large visitation of poliomyelitis in the United States.

TABLE 1.—DISTRIBUTION OF CASES

Month	Cases	Deaths
July	337	97
August	883	226
September	150	40
Total	1,360	363

It is probable that a fresh impetus was given to the disease in America from that date as a result of direct infection brought from Europe, for the reason that the unusual prevalence of poliomyelitis in Norway and Sweden in 1904 and 1905 spread rapidly to the contiguous countries.

It is certain that prior to 1907 poliomyelitis had not shown the same disposition to spread widely among exposed populations, and that the rural population suffered more than that of the cities. The cases in Louisiana in 1841, recorded by Colmer,[1] were few in number. The only epidemic of large size on record previous to 1907 was that of Rutland, Vt.,[2] in 1894, in which there were 132 cases and eighteen deaths. The increase in the spreading power of the disease within recent years may be explained on the assumption that a new and powerful virus has been at work among a susceptible population.

It is unlikely that any modern living conditions are factors which are producing a hypersusceptibility. Be that as it may, it is evident that since 1907 the disease has established itself throughout the United States. In 1910 it was reported as being present in thirty-six states of the Union; in that year there were 5,093 cases and 825 deaths.[3]

For the reason that the epidemiology of poliomyelitis is sufficiently known to establish its status as a contagious disease, it was natural to expect that Newark would not escape infection when the disease became epidemic in New York during the last week of June, 1916.

The two cities are separated by less than thirty minutes' journey by rail, and there are many similarities to New York in the make-up of Newark's mixed population of 400,000.

This conjecture was verified by subsequent events, and there is every reason to suppose that the invasion of Newark by the disease was encouraged by the ready and accessible transit facilities between the two cities.

Statistics show that poliomyelitis is constantly present in cities as well as in rural communities in small foci of prevalence. This endemic type, however, is of low virulence, there is little inclination to spread unduly among the population, and the mortality is low. In the six years previous to 1916 there were ninety-five cases of infantile paralysis reported in Newark with four deaths, a case mortality of a little more than 4 per cent.

The monthly incidence of poliomyelitis in Newark in 1916 corresponded to the observations of Lovett and Richardson in Massachusetts in 1909 and 1910.

In the three months of July, August and September, 1916, there were 1,360 cases of the disease reported in Newark, with 363 deaths, a case mortality of 26.3 per cent.

The incidence curve was highest during the week ending August 12, when 260 cases were reported. The highest case mortality was in the third week of July when 37.5 per cent. of the cases had a fatal termination. After this date the decline in incidence and mortality was consistent, so that in the last week of September there were but twelve cases and one death.

The highest weekly prevalence of poliomyelitis—August 12—was accompanied by a mean temperature of 76 F., the highest but one of all the summer, and a mean humidity of 69 per cent.; the total rainfall for the week was also low. During the week previous to the highest incidence, the highest mean temperature and the least rainfall of the whole summer occurred, and the mean humidity at the same time was low.

TABLE 2.—POLIOMYELITIS CASES AND DEATHS BY SEX AND AGE AT NEWARK, N. J., JULY 3 TO SEPT. 30, 1916, INCLUSIVE

Ages	Males		Females		Total		Case Mortality
	Cases	Deaths	Cases	Deaths	Cases	Deaths	
1 month	2	2	1	1	3	3	100.0
2 months	7	3	5	1	12	4	33.3
3 months	4	1	3	0	7	1	14.3
4 months	9	4	4	0	13	4	30.8
5 months	5	3	3	1	8	4	50.0
6 months	12	7	12	3	24	10	41.7
7 months	12	5	9	5	21	10	47.6
8 months	11	4	9	0	20	4	20.0
9 months	12	1	10	1	22	2	9.1
10 months	13	4	13	6	26	10	38.5
11 months	15	4	11	1	26	5	19.2
Under 1 year	102	38	80	19	182	57	31.3
1 year	187	50	128	43	315	93	29.5
2 years	169	56	125	26	294	82	27.9
3 years	137	30	83	15	220	45	20.5
4 years	79	19	50	14	129	33	25.6
Under 5 years	674	193	466	117	1140	310	27.2
5 years	39	9	31	7	70	16	22.9
6 years	22	7	24	6	46	13	28.3
7 years	11	1	15	1	26	2	7.7
8 years	11	0	3	0	14	0	0.0
9 years	4	2	7	1	11	3	27.3
From 5-9 yrs.	87	19	80	15	167	34	20.4
10-14 years	14	6	13	6	27	12	44.4
15-19 years	2	1	5	0	7	1	14.3
20-24 years	3	1	4	3	7	4	57.1
25-29 years	1	1	3	0	4	1	25.0
30-34 years	1	0	1	0	2	0	0.0
35-39 years	5	1	0	0	5	1	20.0
40-44 years	1	0	0	0	1	0	0.0
Total, all ages	788	222	572	141	1360	363	26.7

The case mortality throughout the epidemic, indicating perhaps a fluctuation in the virulence of the infecting germ, varied considerably during the three months in question. Apparently there was an initial high mortality for the week ending July 22, 37.5 per cent. of the cases. A high mark was reached again in the week ending September 9, 35.5 per cent. of the cases, and again for the week ending September

1. Colmer: Jour. Med. Sc., January, 1843.
2. Caverly: Med. Rec., New York, 1894.
3. Annual Report of U. S. Public Health and Marine-Hospital Service, 1911, p. 236.

23, when 33.3 per cent. of the cases had a fatal termination.

WARD DISTRIBUTION

The first case of epidemic poliomyelitis appeared, July 3, in the Tenth Ward (Fig. 1). By July 8, the end of the first week of the epidemic, there were ten cases reported from this ward as well as two from the Thirteenth Ward, and one each from the Fourth and Fourteenth Wards. The Fourth Ward is contiguous to the Tenth. The Thirteenth and Fourteenth Wards are separated from the Tenth by three city wards.

From this it would seem that the infection was of a multiple nature and arose from more than the one focus in the Tenth Ward. The appearance of the pin map of the first hundred cases (Fig. 1) suggested the existence of two areas of prevalence. A primary

Fig. 1.—The first hundred cases at Newark, N. J.

area with the tenth ward as a starting point, which eventually embraced the Fifth and Twelfth Wards, and a secondary area, sharply defined, which included a very congested and thickly populated neighborhood, comprised the Third, Fourteenth, Thirteenth, Sixth, Seventh, Fifteenth and Sixteenth Wards (Fig. 2).

Some areas especially noticeable in the second pin map indicate a division into even smaller groups, notably one of seventeen cases sharply circumscribed in the Twelfth Ward (northeast corner, Fig. 2), one of fifteen cases at the outer boundary of the Eighth Ward (north part, Fig. 2), and another one of twenty-three cases in the eastern side of the Thirteenth Ward.

In the primary area, the first to become infected, the Tenth Ward, has a population consisting of Italians, Russians, Poles and Polish Jews. These people are junk dealers, rag pedlers, laborers and keepers of small stores; there are also a few factories in this area. The secondary area is made up of a population comprising Russian and Polish Jews, with some Italians and Germans. Every kind of small family industry is carried on in the homes in this section, which is probably the most congested part of the city. There are many tenement houses, the sanitary conditions of which are not of the best.

The Tenth Ward, infected first, attained its maximum of cases in the week ending July 15, after which the prevalence rapidly declined, showing a deficiency of suitable epidemic material. The case mortality, however, was high, 37.5 per cent., the second highest of all the wards. The picture presented in the ward map shows how the cases rose gradually to a pinnacle and then slowly declined, each ward reaching its highest incidence in different weeks of the epidemic.

By the end of the second week of July, ten city wards out of sixteen had been invaded by epidemic poliomyelitis.

Cases from all sixteen wards were not reported until August 5, the fifth week of the epidemic.

POSSIBLE FACTORS OF SPREAD

The first case of epidemic poliomyelitis was reported, July 3, 1916, in a nursing baby in the family of an express driver, whose business daily took him to Brooklyn and New York, where he delivered and

TABLE 3.—PERCENTAGE DISTRIBUTION

Ages	Males		Females		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Under 1 year.....	12.9	17.1	14.0	13.5	13.4	15.7
1 year.....	23.7	22.5	22.4	30.5	23.2	25.6
2 years.....	21.4	25.2	21.9	18.4	21.6	22.6
3 years.....	17.4	13.5	14.5	10.6	16.2	12.4
4 years.....	10.0	8.6	8.7	9.9	9.5	9.1
Under 5 years..	85.5	86.9	81.5	83.0	83.8	85.4
5 to 9 years.....	11.0	8.6	14.0	10.6	12.3	9.4
10 to 14 years.....	1.8	2.7	2.3	4.2	2.0	3.3
15 years and over	1.6	1.8	2.3	2.1	1.9	1.9
Total.....	100.0	100.0	100.0	100.0	100.0	100.0

collected express packages between the two cities. There was no history of exposure to infection other than this; no member of the family had been out of Newark in many months.

In the total number of 1,360 cases during the three months of July, August and September, a direct history of exposure to a previous case was obtained in seventy-nine instances. In none of these cases could any infection be traced to schools or to any one common point of origin.

In sixty-six instances more than one case appeared in the family, and in two instances three cases arose in the same family. When more than one case occurred in the same house, the interval between the times of onset was brief. In twenty families the second case occurred the same day; in seven, within twenty-four hours; in nine, within forty-eight hours; in six, within three days, and in eight families, within four days. In two families in which three cases were reported, the interval between the second and third cases was four and five days, respectively.

The milk supply showed that 267 families used raw milk; 533, pasteurized milk; 442, condensed milk, and 148 families used no milk.

No definite relationship could be established in the number of rooms occupied by families, and the cases of poliomyelitis developing in these families.

In view of the fact that from 50 to 60 per cent. of all the cases reported were treated in hospitals, there must have been occasions when infection might have been spread from sick children to the well in the hospital wards, and yet not a single instance of this nature was reported during the period of the epidemic.

The history of the cases reported during the first week in July did not appear to suggest any definite common origin of infection. Briefly, the occurrence of these cases was as follows:

CASE 1.—In the Tenth Ward, in the family of an express driver to Brooklyn. The baby was breast fed. There was no history of exposure.

CASE 2.—In the Fourth Ward, eleven blocks from the first case. The physician and the milk and food supply were different. There was no history of exposure.

CASE 3.—In the Tenth Ward, one and one-half blocks from the first case, in the family of a junk dealer. There was no history of exposure.

CASE 4.—In the Tenth Ward, four and one-half blocks from the nearest case, in an Italian family. The patient was a nursing baby. There was no exposure.

CASE 5.—In the Thirteenth Ward, 1¼ miles from the nearest case, in the family of an Italian, the driver of a milk wagon. There was no exposure.

TABLE 4.—CASE FATALITY (DEATHS IN EVERY HUNDRED CASES)

Ages	Cases	Deaths	Percentage
Under 4 months	22	8	36.4
4 months to 1 year	160	49	30.6
Under 1 year	182	57	31.3
1 year	315	93	29.5
2 years	294	82	27.9
3 years	220	45	20.5
4 years	129	33	25.6
Under 5 years	1,140	310	27.2
5 to 9 years	167	34	20.4
10 to 14 years	27	12	44.4
15 years and over	26	7	26.9
Total, all ages	1,360	363	26.7
Total males	788	222	28.2
Total females	572	141	24.7

CASE 6.—In the Tenth Ward, in an Italian family. The patient was a breast-fed baby, a cousin of the fourth patient. There was history of exposure.

CASE 7.—In the Tenth Ward, four blocks from the nearest case, in an American family. There was no exposure.

CASE 8.—In the Tenth Ward, half a block from the nearest case, in a Polish family. There was probable exposure.

CASE 9.—In the Tenth Ward, two blocks from the nearest case. There was no evidence of exposure.

CASE 10.—In the Tenth Ward, six and one-half blocks from the nearest case, in an American family. There was no exposure.

CASE 11.—In the Tenth Ward, two blocks from the nearest case, in an American family. There was no exposure.

CASE 12.—In the Fourteenth Ward, a mile from the nearest case, in a Jewish family. There was no exposure.

CASE 13.—In the Thirteenth Ward, in the family of a German, a chauffeur for the City Hospital ambulance. There was no exposure. The nearest case was at a distance of five blocks.

CASE 14.—In the Tenth Ward, in an Italian family. The father of the patient was a street cleaner. There was no exposure. The nearest case was half a block away.

DISTRIBUTION AND MORTALITY

Males appeared to be more susceptible than females to poliomyelitis, the number being 788 males and 572 females. The type of disease in males would also appear to be severe, the case mortality for males being 28.3 per cent. of recorded cases as compared with a case mortality of 24.7 per cent. for females.

Of all the patients, 83.8 per cent. were under 5 years of age, and 85.4 per cent. of the deaths were at this age. Under the age of 5 years the greatest incidence was at the 1 year period, 23.2 per cent., as was also the percentage of mortality to all deaths, 25.6.

The case mortality for all ages was 26.7 per cent.; at 1 month of age the case mortality was 100 per cent.

Under 1 year, 31.3 per cent. of the cases were fatal, under 5 years, 27.2 per cent., and between 5 and 9 years, 20.4 per cent.

Between 20 and 24 years the disease appeared to manifest unusual virulence, a case mortality of 57.1 per cent. being recorded. Similarly, between 10 and 14 years the fatality was 44.4 per cent. All the monthly age periods under 1 year showed the fatality to be also unusually high.

Fig. 2.—Complete cases, July, August and September, 1916.

The incidence rate in Newark, 3.3 per thousand population, was considerably higher than in New York City, 1.8, and in Hoboken and Jersey City, each of which had a rate of about 1 per thousand population.

CLINICAL TYPES AND DIAGNOSIS

Of the clinical types of poliomyelitis, so exhaustively described by Wickman, Frauenthal and others, the spinal predominated. In this class of cases, few symptoms of gravity were present. The onset was usually of such mildness that the lameness resulting from paralyzed muscles or groups of muscles was frequently the only complaint by children to parents or guardians.

This frequently brought about stories of falls and minor accidents as the cause of the inability to use a limb. The explanation by physicians of the true nature of the disease was frequently received with

incredulity. At the beginning of the epidemic, during the third week many fatal cases of the medullary and pontile types were observed, with respiratory involvement. Our experience in this line tended to confirm the observations of Wickman and Frauenthal that this type furnished by far the greater number of fatalities.

The laryngeal distress and other throat symptoms at times brought about a diagnosis of diphtheria, further observation showing it to be infantile paralysis. The case mortality in the third week was 37.5 per cent., and indicated the presence of a virulent infection.

Report of sudden deaths of infants were frequent at this time. When subsequent necropsy was possible, a diagnosis of poliomyelitis frequently resulted. Gastro-intestinal symptoms, diarrhea and colic did not attend the initial symptoms. Constipation was present in the majority of cases, in this way confirming the observations of other investigators on the onset of the disease.

Of the meningeal types observed, some difficulties may have arisen in differential diagnosis from cerebrospinal fever. The rapid onset of paralysis, however, usually cleared up the diagnosis.

Patients who recovered from poliomyelitis with meningeal symptoms did not usually have any permanent paralysis, the reason for which is no doubt anatomic.

In the diagnosis of doubtful cases, the cardinal tests relied on were a positive Kernig's sign; stiff neck, spinal rigidity, as shown by inability to flex the spine by gentle pressure in the cervical and sacral regions, the body being held elevated at these points and spinal tenderness or even actual pain in attempting to rotate or bend the spinal column. Impaired reflexes were constant in nearly all situations. It was remarkable how frequently a cursory examination without the knowledge of the tests necessary for giving a correct judgment was made the basis of a negative report by physicians.

A careful examination made by one fully conversant with the knowledge that an attack of poliomyelitis leaves behind it lowered reflexes and lessened muscle tone seldom failed to demonstrate convincing signs of spinal tenderness or a paralysis of muscles previously overlooked.

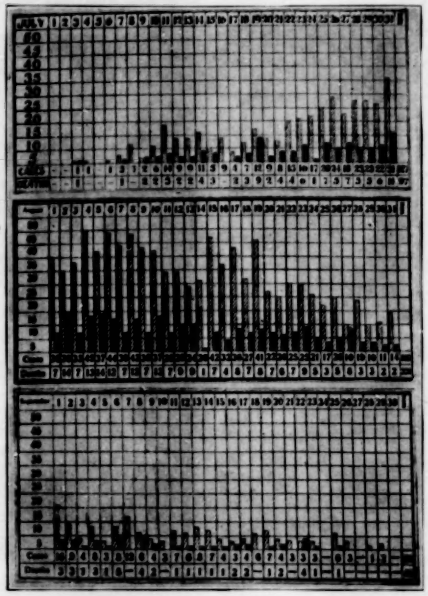

Fig. 3.—Incidence and mortality, July, August and September.

PATHOLOGIC NOTES

Dr. Harrison Martland, the city pathologist, was enabled to carry out thirty necropsies in fatal cases of poliomyelitis.

The following are Dr. Martland's observations:

Gross Pathology of Poliomyelitis.—Usually the child is from 1 to 5 years of age, and well nourished; very few are emaciated. There is a peculiar pallor to the body.

Lesions Showing the Brunt of the Attack is on the Central Nervous System.—In the brain there is intense acute encephalitis, the gray matter having a characteristic color ranging from a pinkish gray to a scarlet, copper, purplish hue. This color I have not seen in any other conditions with the possible exception of tetanus, rabies or some cases of acute traumatic encephalitis. It never occurs in most of the common meningitides. The color does not seem to be mentioned in the literature, although I know that several well known pathologists have observed it. I have been able to diagnose poliomyelitis cases from this color, having substantiated it by other findings. The meninges are quite free and clear to the naked eye, and even in the meningitic type of case nothing is seen with the naked eye, although the section may show a considerable lymphocytic infiltration of the pia-arachnoid. I have seen internal hydrocephalus only once, and then it was very moderate in extent.

The cord shows little from the meningeal surface, except active hyperemia. The meninges of the cord in some cases are distinctly edematous. I have never seen the softening of the cord described by some observers. The superficial vessels are injected. On cut section, through areas showing typical lesions a rather characteristic picture is seen. The gray matter of the cord shows as a distinctly prominent gray H. In this gray matter and usually in the anterior horns one or more bright red spots can be seen. These spots are not, however, always confined to the anterior horns, but may appear in the posterior horns, particularly in Clark's column. There is sometimes a pinkish color to the white matter of the cord, especially in the anterior columns.

The medulla and pons show little but active hyperemia. Under the microscope there are extensive lymphocytic foci, perivascular and diffuse through the vital centers, with edema and chromatolysis in the neurons.

The nervous system bears the brunt of the attack. The patients always die of medullary involvement, with respiratory paralysis. The process is a diffuse interstitial inflammation of the central nervous system, which can be localized more severely in certain patches throughout the nervous system, thus giving rise to any symptom occurring in nervous diseases, similar in some respect to multiple sclerosis. For the present the name of Heine-Medin disease is perhaps preferable, as it is impracticable to give it any anatomic name.

Lesions Caused by Mode of Death.—As death occurs from respiratory paralysis in over 99 per cent. of cases and this is due to the inflammatory process invading the medulla and respiratory centers, the following lesions as seen in cases of asphyxia are more or less present: Lungs: Pleural ecchymoses; parietal and visceral. Acute interstitial emphysema, with blebs under the visceral pleura. Heart: Right heart

dilatation with dark blood. Pericardial and sometimes endocardial ecchymoses.

Lesions Due to Bacterial Nature of Disease—Toxic.—Heart: Cloudy swelling. Liver: Cloudy swelling. Kidneys: Cloudy swelling to a toxic and degenerative tubular nephritis.

Lesions Which Whould Suggest Portals of Entry of Germ.—Intestines: Small, pinkish hyperplasia of Peyer's patches and solitary follicle with pinkish hyperplasia of mesenteric glands. Colon: Follicular colitis with hyperplasia of solitary follicles. Mucosa: Nasal and tonsils in cases examined were quite free and clear; also throat mucosa.

COINCIDENT PARALYSIS IN DOMESTIC ANIMALS

From the beginning, poliomyelitis was looked on as a contagious disease, much attention being paid to the paralysis occurring in domestic animals on the supposition that animals were responsible for the spread of the infection. During July, August and September, 1916, cases of paralysis in animals were brought to the attention of the board of health.

Considerable interest was aroused as to the possible relationship between such pathologic conditions among animals and the existence of poliomyelitis cases in children.

Dr. Harrison Martland investigated four of these paralysis cases and submitted the following conclusions as the result of his investigations on one horse, two dogs, and one cat.

ANIMAL 1.—Fox terrier dog had paralysis of the hind limbs extending to the fore legs, and died with convulsions. Acute encephalitis was found. The gray matter was pinkish. There was active hyperemia of the cord, with a suggestion of punctate red spots near the anterior horns. Microscopic examination of the brain and cord revealed suggestive round cell infiltration in the cord but no typical lesions of human poliomyelitis. Examination of the lungs revealed bronchopneumonia. There was cloudy swelling in the heart muscles, kidneys and liver, and acute splenitis.

Three fox terrier puppies inoculated in the subdural space with emulsion of this dog's brain and cord in 50 per cent. glycerin gave negative results. Several attempts were also made to inoculate dogs by an intracranial route with emulsion of brain and cord from human poliomyelitis patients but with negative results in all cases.

ANIMAL 2.—Small fox terrier puppy had supposed well marked paralysis of the hind limbs. Moderate encephalitis was found. The cord showed a few red spots in the gray matter near the anterior horns. Microscopic examination revealed an active hyperemia in the lower cord with diffuse lymphocytosis. Later examination of the cord from normal dogs revealed a considerable number of small round cells, and as the lesion in this case was not at all perivascular, it may be assumed that the numerous small round cells are not abnormal. The main pathologic condition did not indicate poliomyelitis. The cause of death appeared to be a distinct encephalitis with hemorrhage in and near the anterior horns of lower cord.

ANIMAL 3.—Cat had respiratory difficulty, and paralysis of the hind limbs. A diphtheritic membrane in the larynx was found, covering the vocal cords. Smears revealed the presence of bacilli resembling the Klebs-Loeffler bacillus with cultures negative. The brain and the cord were negative for poliomyelitis.

ANIMAL 4.—Horse with symptoms of hindleg paralysis was shot. Thrombosis of the mesenteric veins, and acute nephritis were found. The brain and the cord were normal.

COMMENT

There is a considerable and variable number of diseases in domestic animals presenting clinical symptoms of paralysis of sudden onset resembling human poliomyelitis. Gross and microscopic anatomic examination have failed, however, to reveal any resemblance to the lesions found in human or experimental monkey paralysis.

Paralytic diseases in the lower animals appear not to be at all uncommon, and their recorded prevalence during epidemic times is due to the increased attention paid to such conditions in man.

There is no reason to suppose that the lower animals play any part in the spread of human poliomyelitis, and it is extremely doubtful if poliomyelitis exists among them.

SUMMARY

There is every reason to suppose that the infection of poliomyelitis was carried from the original focus in Brooklyn to Newark in July, 1916.

The first case occurring in the family of an express driver who went daily to Brooklyn suggests an adult means of infection.

Proximity to New York and Brooklyn undoubtedly was the factor in the undue prevalence of poliomyelitis in Newark. Direct exposure to previous patients was known in seventy-nine instances among 1,360 cases.

No nationality or condition of social life was exempt from infection.

Two cases in one family were reported sixty-six times.

Infection by food was not suggested, nor could any sanitary condition other than that existing in congested areas be shown to have any bearing on disease incidence.

No definite focus of disease was traced to schools. There was no case of contact infection in hospitals.

TABLE 5.—WEEKLY WARD DISTRIBUTION OF POLIOMYELITIS CASES AND DEATHS

Date	Wards																Total Cases	Total Deaths	Case Mortality	Temperature Mean	Humidity Mean	Total Rainfall
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16						
July 8	...	...	...	1	...	...	...	...	...	9	...	...	2	1	...	...	13	2	15.4	73.6	64.1	0.16
July 15	...	...	5	1	6	2	2	...	...	17	...	4	3	9	...	7	56	18	32.1	74.6	68.6	0.89
July 22	1	2	11	4	15	...	3	...	2	9	...	7	4	3	...	3	64	24	37.5	75.0	77.6	0.44
July 29	1	15	32	2	25	1	5	2	2	14	...	8	11	12	3	8	141	36	25.5	75.3	76.4	2.37
August 5	4	3	46	6	27	5	11	2	13	12	4	33	15	17	4	31	233	72	30.9	77.1	56.7	Trace
August 12	6	11	51	5	12	12	25	2	13	16	4	18	19	37	4	24	259	67	25.9	76.0	69.0	0.34
August 19	17	6	36	2	6	9	16	2	22	4	6	20	31	26	6	21	230	44	19.1	71.6	58.0	0.47
August 26	3	2	9	3	6	8	11	4	16	4	2	10	25	30	10	7	150	42	28.0	77.0	54.6	Trace
September 2	5	2	7	2	1	8	4	5	12	2	1	9	15	9	4	3	89	24	27.0	70.7	58.8	0.03
September 9	2	1	2	...	3	3	2	4	3	1	2	1	5	5	4	6	45	16	35.6	71.7	69.7	0.37
September 16	2	3	3	1	1	1	1	5	1	...	2	3	6	2	5	1	36	7	19.4	67.7	56.7	1.79
September 23	2	...	1	...	...	1	...	8	1	...	1	2	9	3	1	1	30	10	33.3	60.8	59.7	1.12
September 30	1	...	...	1	...	...	...	2	2	...	...	...	1	2	2	1	12	1	8.3	60.9	59.1	0.38
Total cases	45	45	203	28	102	50	80	36	87	88	23	115	146	156	43	113	1360	363	26.7			
Total deaths	18	11	49	5	31	15	24	11	21	33	3	28	36	42	14	22						
Case mortality	40.0	24.4	24.1	17.9	30.4	30.0	30.0	30.6	24.1	37.5	13.0	24.3	24.7	26.9	32.6	19.5						

The endemic type of poliomyelitis has a case mortality of 4 per cent., and an epidemic case mortality of 26.3 per cent.

Seasonable prevalence is highest in August, associated with a high mean temperature and a low mean humidity and rainfall.

Cases of poliomyelitis in Newark appear to have begun from multiple foci and not from a single focus of infection from which the whole community was attacked.

Small areas of incidence indicate the spread of infection from one exceptionally virulent case.

Of all those attacked, 83.8 per cent. were under 5 years of age.

Of all those who died, 85.4 per cent. were under this age.

Males were more susceptible to the disease than females.

Spinal types of the disease predominated, and many mild cases were observed suggesting a much wider prevalence of these in epidemic times.

Respiratory fatal cases may be mistaken for diphtheria or croup.

At necropsy a characteristic color of the gray matter was observed ranging from pinkish gray to scarlet.

No softening of cord as mentioned by other observers was encountered.

The nervous system bears the brunt of the attack, death being due to respiratory paralysis in 99 per cent. of all fatal cases.

Lesions in the intestine suggest a portal of entry of infecting organisms.

The nasal and tonsillar mucosae were found normal.

Paralyzed domestic animals found during the epidemic did not show at necropsy any pathologic lesions resembling human or monkey poliomyelitis.

There is no reason to suppose that the lower animals play any part in the spread of poliomyelitis, and it is extremely doubtful if poliomyelitis exists among them.

CONCLUSIONS

Epidemic poliomyelitis appears to be a disease carried directly from place to place by some human carrier not yet possible of identification.

Infection by direct contact, although possible, is not probably the commonest way of infection.

The predisposing causes of the disease seem to be age (under 5 years) and season (high temperature and low rainfall).

Studies.—Histories make men wise; poets, witty; the mathematics, subtle; natural philosophy, deep; moral, grave; logic and rhetoric, able to contend.—Bacon.

THE ABSOLUTE DETERMINATION OF INTRACRANIAL PRESSURE

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PITTSBURGH

It is more than thirty years since Corning performed the first lumbar puncture for therapeutic purposes. This diagnostic aid has now become of almost routine frequency, and yet but little effort has been made, except by the experimentalist or the occasional specialist, to emphasize the importance and value of a real scientific estimation of cerebrospinal fluid pressure.

To the thoughtful observer, the slipshod methods usually employed for this purpose are unsupportable. The estimation of the pressure by the rapidity of flow from the lumbar puncture needle, the height to which the fluid may ascend in an attached tube, or other crude methods, is as justifiable as would be the introduction of a cannula into an artery or a vein to estimate the blood pressure from the distance of the spurt or its rise in a column. Under constant pressure, the rapidity of flow from a lumbar puncture is dependent on many factors: the caliber of the needle; the accuracy of its introduction; the possible partial occlusion of its tip by membranes or nerves; the position of the patient, and the individual judgment of the observer. Hydrostatic pressure, however, if the patient remains in a constant position, will remain the same under all these circumstances. The accurate estimation of this pressure is possible only with some form of manometer. I am well aware that certain manometers have been proposed and used for this purpose, but they have been either of too delicate construction or too cumbersome for common use. Furthermore, the lack of formulated and standardized rules for their employment has led to widely varying statements as to the normal pressure, and so much confusion has resulted that they have been practically discarded as useless. The normal pressure has been stated by Adamkiewicz to be from 80 to 100 mm. of water; by Key and Retzius, from 160 to 200 mm.; by Quincke, from 40 to 60 mm.; by Koenig, from 125 to 150 mm. There is a variation in these statements of from 40 to 160 mm. of water as a minimum to from 60 to 200 as a maximum. It is inconceivable that, under normal conditions, such latitudes of pressure are possible; at least, they form no basis for comparison in judging abnormal conditions.

To overcome these difficulties and to secure a reliable and simple instrument which could become of com-

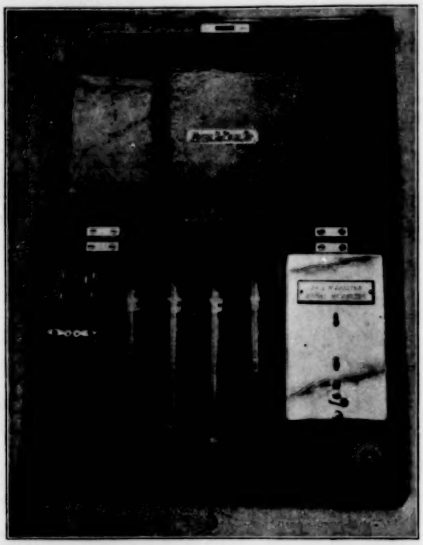


Fig. 1.—Author's spinal pressure outfit, containing manometer, spinal needles, novocain solution, 5 per cent., glass graduates with weighted bases, and test tubes.

mon and practical use, I devised and have used for the past two years the needle and manometer illustrated herewith. It is hoped that this instrument, or one equally as good, may be accepted as standard, and that attention will be paid to the details of its use, to the end that the estimation of intracranial pressure may be rescued from the realm of guesswork to that of scientific certainty, and that from the accumulation of large numbers of individual observations we may be able to

Fig. 2.—Properly equipped lumbar puncture tray; *A*, manometer; *B*, spinal needle; *C*, connecting tube; *D*, *D*, hypodermic syringe and needle; *E*, Hagedorn needle; *F*, iodin, 3.5 per cent.; *G*, novocain, 0.5 per cent.; *H*, glass for novocain; *I*, *I*, glass graduates with weighted base; *J*, *J*, test tubes; *K*, sterile covers; *L*, small sponges; *M*, sponge forceps.

establish the normal and to interpret and utilize the findings of abnormal spinal pressure.

The instrument consists of a small mercury manometer with a corrected scale, graduated in millimeters up to 70, attached between the arms. The scale can be adjusted so that the zero mark can be placed at the mercury level. At the top of each arm is a cut-off valve to prevent loss of mercury when the manometer is not in use. The openings for attachment to the needle are ground to standard record gage to admit a tip on the rubber tube connecting the needle and monometer. This permits of quick and easy connection.

The special needle of No. 12 wire gage is constructed of iridioplatinum. This metal will bend or kink, but is not easily broken. The shank or outer end of the needle has a Y outlet with a two-way cut-off cock valve. This permits of opening either outlet while the other is closed, or both may be closed at the same time so that no fluid can escape until the first reading is made. The tips of these outlets are of record pattern. The tube leading to the manometer is attached to the straight outlet; through the lateral outlet, the fluid when desired, is permitted to flow from the needle. The manometer and needle, and the connecting attachment, together with a 1 c.c. record syringe and needle for local anesthesia, are contained in a small metal case of pocket size. For private use, outside the hospital, I have found useful the proper graduates and test tubes for collecting and carrying the fluid and a small bottle and glass for the local anesthetic which renders lumbar puncture painless. These additions, together with the manometer, are carried in a small wooden cabinet with compartments for each. Provision is also made for carrying two extra needles, one of short length for use in infants. With this outfit, one has all the essentials for properly performing a lumbar puncture.

Certain standard conditions have been found essential if uniform and comparable pressures are to be secured. The patient should always be in the lying position with the cerebrospinal axis as nearly as possible in a position horizontal with the table or bed. Any deviation from this position, even the raising or lowering of the head, will modify the reading. The truth of this is best illustrated by the accompanying illustration. In Figure 4 the patient is in the proper position and the pressure is seen to be 8 mm. Without removing the needle, the patient was placed in the sitting posture, in which (Fig. 5) it will be seen that the pressure recorded has risen to 35 mm. Both of these readings are normal, one for the horizontal, the other for the vertical position, the increase in the latter being due to the change incident to raising a column of fluid the height of the cerebrospinal axis above the level of puncture. It is impossible and unnecessary to place all patients in the sitting posture whose spinal pressures we wish to take; therefore, in order to standardize readings, the first position is indicated.

The patient is placed on the left side, with the spine well arched by flexing the neck and thighs. Puncture is made in the midline between the fourth and fifth lumbar vertebrae after anesthetizing the skin and subcutaneous tissues at the point of puncture by the injection of 0.5 per cent. novocain solution. The entry of the needle through the skin is greatly facilitated by making this initial puncture with a Hagedorn needle, or any cutting edge needle, as the bevel on the lumbar needle is short and the material rather soft; it is often a little difficult to introduce through the skin without this preliminary preparation; it is also less painful. As soon as it is felt that the dural sac is punctured, the stylet is withdrawn, and at the appearance of the first drop of fluid, the shut-off cock is turned to the left, thus shutting both outlets until proper connections are made. The rubber tubing connecting the straight outlet and the right hand arm of the manometer is attached and all valves opened. The mercury will immediately rise in the left hand arm, and the height

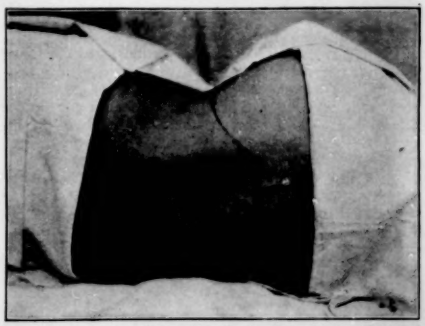


Fig. 3.—Patient in proper position for lumbar puncture. Note horizontal plane of spinal axis.

is noted on the scale. The lateral outlet of the needle may now be opened, which at the same time cuts off the straight outlet and permits the fluid to escape. Withdrawal of fluid is thus at all times under full control, guided by the effect on the pressure.

Puncture may be done and pressure taken as safely in cases of posterior fossa lesions as in those of pretentorial situation, since actual withdrawal of fluid is not necessary in order to estimate the pressure.

Not only do the needle and manometer permit of perfect control over the withdrawal of fluid, but also they are of distinct advantage in the intraspinal administration of serum or other therapeutic agents. Through the lateral outlet the serum may be injected by either the syringe or the gravity method, repeated

Fig. 4.—Manometer attached, showing normal pressure with patient in proper position.

readings during its introduction controlling both the rate of flow and amount injected.

Oscillations of the mercury column occur synchronously with the pulse and respiration, respectively, but are slight and of no moment. Calmness and quiet on the part of the patient are, however, essential, as struggling, straining or resistance will greatly raise the pressure temporarily and negative the findings during their occurrence.

From a large number of observations, we have found that normal intracranial pressure varies from 6 to 10 mm. of mercury, with an average nearer 8 mm. Readings even slightly above 12 mm. under proper attention to details of the technic are regarded as suspicious. Abnormal pressure varies from only slight rises to enormous tension, the highest probably occurring in the acute meningitides, in which the patients perish as often from the intracranial tension as from the acute toxemia. In cases of tuberculous meningitis, for instance, I have observed the mercury shooting completely out of the open arm of the manometer, indicative of the tremendous influence of the tension in this disease.

The various conditions which may be responsible for increased intracranial tension are so numerous that they cannot be considered in this communication. However, I have never seen an increased pressure revealed in a purely functional condition, while in organic lesions this complication is nearly always present at some stage. In the latter instances, spinal pressure is very often a valuable guide in their treatment. There are reasons for believing that in many cases of traumatic, and in some instances of so-called idiopathic epilepsy, there is constantly, or at least prior to the attacks, an increase in intracranial tension. If the presence or absence of this factor can be established, we have some guide as to the advisability of operative interference in certain of these cases. The value of the study of spinal pressure under these circumstances has been clearly demonstrated to me in two cases coming under notice within the past few weeks.

Again, we find ourselves more and more often guided by manometric readings in the treatment of cranial traumatism, both recent and in those often vague but distressing consecutive or remote conditions, the late results of cerebral injury. The value of spinal pressure estimation in suspected intracranial tumors is of inestimable value, variation in tension occurring long before the intra-ocular symptoms become manifest. If we would but avail ourselves of such a diagnostic aid, often the distressing results of prolonged intracranial tension would be avoided by the early institution of proper operative interference. These facts are well recognized by those engaged in neurologic surgery but are wofully neglected by the vast majority who negligently permit the poor victims of these conditions, subjected to various procrastinating treatments, to go from bad to worse until, as a last resort, they are foisted on the surgeon in a vain endeavor to restore a hopelessly lost vision, to relieve the unbearable headaches, and to prolong a miserable and unwelcome existence.

We should not lose sight of the vast field for clinical investigation into the cerebral disturbance occurring in the course of constitutional disease, such as the delirium of the infectious fevers, the "meningismus" of the Germans, in which there is reason to believe that in conjunction with the presence of irritant toxins in the cerebrospinal fluid, there is also an increase in secretion and consequent hypertension of the fluid.

Fig. 5.—Same patient as in Figure 4; improper position. Note change in mercury level.

The same conditions obtain in alcoholic delirium, in the cerebral disturbances in puerperal eclampsia, and in carbon monoxid poisoning. An almost untouched field lies open for determination of the part played by the cerebrospinal fluid in these complications, as well as to the best methods to pursue in their alleviation.

931 Carnegie Building.

OPERATIVE CURE OF CONGENITAL PYLORIC STENOSIS

THYMIC DEATH AFTER SEVEN MONTHS; NECROPSY

J. LOUIS RANSOHOFF, M.D.
Fellow of the American College of Surgeons
AND
PAUL G. WOOLLEY, M.D.
CINCINNATI

The efficiency of the Rammstedt partial pyloroplasty in the treatment of congenital pyloric stenosis has been firmly established by many clinical observations, particularly those of Downes.

Fig. 1.—Thymus.

Its superiority to gastro-enterostomy is undoubted. It can be done in far less time, with less shock and through a smaller incision. As the gastro-intestinal canal is not opened, the danger of infection is minimized. Perhaps its greatest advantage is the restoration of the continuity of the gastro-intestinal canal. Since vomiting is not so frequent as after gastro-enterostomy, the vital problem of the feeding is simplified.

The anatomic confirmation of the value of this operation is shown in the case reported herewith, which so far as we can learn is the only one which has been reported after a complete cure.

History.—An infant, aged 10 weeks, seen with Dr. Max Dreyfoos, had had continuous and intractable vomiting since the third week of life. The child was exceedingly debilitated and thin, weighing less than at birth. A pyloric tumor could easily be felt. Gastric peristalsis was evident. Through an incision to the right of the middle line the pylorus was exposed. It was found occupied by a tumor of cartilaginous hardness, 2 cm. long and 1 cm. thick. A typical Rammstedt operation was done. The child's recovery was rapid and uneventful. Feeding was at once begun, and the child gained 14 ounces the first four days after operation. At the age of 6 months the child was in every way normal, except that it was slightly overweight. In the middle of the seventh month, the child, without warning, was found dead in bed.

Necropsy.—The body was that of a normal well developed and nourished child. There had been some hemorrhage from the mouth. The cause of death undoubtedly lay in an unusually large thymus (65.5 gm., Fig. 1), for there was nothing else found in the body which could by any stretch of the imagination be chosen as even a remote cause. There was a considerable congestion of the viscera, which could be due to thymus pressure. The lymphatic glands were not as generally hyperplastic as one would expect in an outspoken status lymphaticus; the gastro-intestinal, urogenital and respiratory tracts were, except for the congestion, healthy.

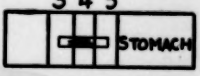


Fig. 2.—Key to location of sections given in Figures 3, 4 and 5.

One might be asked whether the death was due to the mechanical effects induced by the thymus or to some chemical factor contributed by the gland. In the present state of our knowledge we must give it as our opinion that death resulted from the mechanical effects.[1]

The stomach was normal and contained no blood, and the pylorus was patent. The pyloric portion of the stomach, the pyloric ring and the first part of the duodenum were removed for study.

Along the anterior surface of the pylorus there was a shallow linear depression approximately 2 cm. long, which represented the scarred site of a previous surgical incision, and on this groove and its margins were tags of old fibrous adhesions, rather tenuous in texture, which had united the pylorus to the adjacent tissues. From this specimen three smaller ones were made so that about half the groove was represented in the middle portion and a quarter in each of the others. From each of these portions sections were made, and stained with hematoxylin and eosin (Fig. 2). The numbers of the photographs indicate the location of the section in the sketch).

Fig. 3.—Section, location of which is shown in Figure 2.

The sections all showed practically the same state of affairs, namely, that from the bottom of the groove to the submucosa there was a band of fibrous tissue which represented a loss

1. Compare Park: Jour. Exper. Med., 1917, **25**, 129, Rev. Jour. Lab. and Clin. Med., 1917, **2**, 361.

of muscular tissue in that region. The appearances may be compared with those which would be seen in case a ring shaped muscle were supplied at one point with a tendon.

Aside from this, the other parts of the tissue seemed healthy. There was no bulging toward the exterior of the mucosa, no evidence of diverticulum formation or hernia, and everywhere the other layers of the organ seemed healthy. It is possible that the muscular layers were somewhat better developed than would be called normal, but the variation seemed too slight for weight to be attached to it.

It appears that the surgical incision permitted the muscular coats of the tissue to retract and the opening to gape, and that subsequently the space was filled with organized tissue, which, in its fully developed state, was fibrous tissue. This has formed a typical linear contracted scar. It seems that during the healing of the wound the pyloric orifice became dilated and then remained so, and thereafter performed its function in an acceptable manner.

This is an anatomic proof of the perfect efficiency of this operation. It shows also the futility of the numerous modifications, which only complicate the operation without in the least improving it. Another interesting feature is the disappearance of the tumor mass, which was plainly shown at the operation.

An important point is the association of enlarged thymus with congenital pyloric stenosis. This was present in lesser degree in another of our cases, which promptly yielded to Roentgen therapy. Palmer has shown the frequency of the simultaneous occurrence of the two conditions.

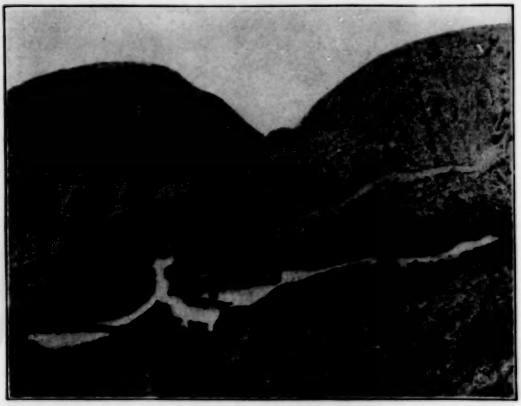


Fig. 4.—Section, location of which is shown in Figure 2.

The prevalence of enlarged thymus has been greatly underrated. In a recent communication before the Cincinnati Academy of Medicine, at Cincinnati, J. E. Benjamin reported nineteen cases occurring in 220 consecutive patients of the pediatric clinic. The diagnosis was in each case confirmed by the Roentgen ray.

This frequency of enlarged thymus probably best explains its not uncommon association with pyloric stenosis. However the case may be, it is not unwise to be on the lookout for enlarged thymus, which once discovered is so readily cured by the Roentgen ray.

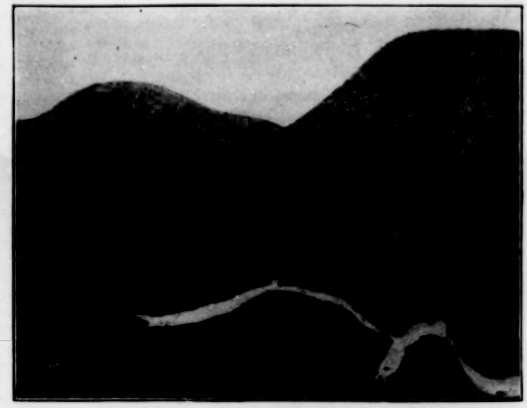


Fig. 5.—Section, location of which is shown in Figure 2.

Railway Accidents.—*Accident Bulletin 58*, covering October, November and December, 1915, and *Bulletin 59*, covering January, February and March, 1916, contain data relative to accidents on steam and electric railways for the respective periods as reported by steam and electric railway companies to the Interstate Commerce Commission under the accident report law of May 6, 1910. 'For the last quarter of 1915 the number of killed in train accidents on the steam railways of the United States was 134 and the number injured 2,107. The total number of persons killed in all classes of accidents was 2,391, and the number of persons injured, 44,605. This includes 2,166 persons killed and 13,846 injured as the result of train service accidents to railway employees while at work, passengers getting on and off cars, by persons at highway crossings, persons doing business at stations, etc., as well as by trespassers and others. It also includes ninety-one persons killed and 28,652 persons injured in casualties reported as "nontrain accidents." On the electric railways during the same period one person was killed and 165 injured, including employees and all other persons in all forms of accidents. During the first quarter of 1916 the number of persons killed in steam train accidents was 188 and the number injured 2,100. The total number of persons killed on steam railways was 2,138 and the number of injured 46,048. This includes 1,808 persons killed and 14,122 injured in train service accidents by employees while at work, by passengers getting on and off cars, persons at highway crossings, persons doing business at stations, etc., trespassers and others. It includes also 142 persons killed and 29,826 injured in casualties reported as "nontrain accidents." On the electric railways during the same period seven persons were killed and 249 injured.

ACCIDENTAL SURGICAL INJURIES TO THE BILE DUCTS

WITH REPORT OF A CASE

AXEL WERELIUS, M.D.
CHICAGO

In spite of the meager reports of operative injuries to the bile tracts, no doubt such surgical accidents are not as rare as the paucity of the literature on the subject would indicate. The majority of such injuries occurred in the hands of able surgeons; some happened to masters in this particular field. Thus it is safe to assume that in the experience of men of lesser eminence such calamities are not so extremely rare.

Jacobson[1] has collected reports of thirty-four cases; to these may be added two by Moynihan[2] and the case reported below.

The case which I report is the only one of its kind in the literature, and is unique from the type of injury inflicted, namely, complete severance of the common duct with proximal and distal ends securely tied, thus completely shutting off the bile flow from the liver to the duodenum. It is the third case in which there was a secondary operation for repair of the common duct.

The liability of the ducts to injury may be explained by the rather frequent anomalies of the course of these channels due to pathologic conditions.

Fig. 1.—Accidentally resected duct with both ends tied.

The topography of the ducts has been studied by several investigators, but especially good work was done by Bruge,[3] Shackner[4] and Brewer.[5]

1. Jacobson, J. H.: Am. Jour. Obst., 1914, **70**, 6.
2. Moynihan: Abdominal Surgery, p. 210.
3. Bruge, E.: Verhandl. d. deutsch. Gesellsch. f. Chir., 1908, **37**, 238-268.
4. Shackner: Ann. Surg., October, 1910, p. 419.
5. Brewer: Ann. Surg., **29**.

Bruge found in a series of forty-three specimens that in the majority of the subjects the cystic duct in its terminal part ran parallel to the hepatic duct, and in only a few cases united with the latter at the classical acute angle. In a few instances, the cystic duct approached the hepatic at an acute angle and then ran

Fig. 2.—Method of anastomosis.

parallel to it. In some cases, the two ducts ran parallel to each other for the greater part of the course, closely bound together with connective tissue. In a number of cases, the cystic duct partly or completely encircled the hepatic duct in a spiral manner, the spiral always running toward the right. In this connection, it might be of interest to mention that in the preceding cases it would be impossible to tell in which duct a stone might be located. Also, a stone in the cystic duct might, by pressure on the hepatic, give all the ordinary symptoms of common duct obstruction. Thus it is seen that with such abnormalities, and especially with added pathologic conditions, the ducts might easily be injured during operations in this field. However, if Judd's[6] method of identifying and tying separately the cystic artery and the cystic duct is employed, there should be no danger of injury to the common duct. According to W. J. Mayo, this procedure can be used in the majority of cases.

REPORT OF CASE

History.—A woman, housewife, aged 47, had been operated on, a week before I saw her, May 15-16, by a physician who had performed a cholecystectomy for gallstones. Subsequent to the operation the patient had rapidly developed all the symptoms characteristic of common duct obstruction. The physician expressed fears that he had accidentally tied off the common duct. The history otherwise was negative.

6. Judd, E. S.: Ann. Surg., 1915, **61**, 306.

Examination.—The patient's general appearance was that of a fairly nourished, middle aged woman, intensely icteric. Examination of head, neck and chest was negative. The abdomen showed the healing scar of a Bevan incision. Palpation was negative. The urine showed the presence of biliary pigments; the stool was clay colored. Pulse, respiration and temperature were practically normal.

Operation.—I performed an operation, June 22, under ether anesthesia, assisted by Dr. C. Phifer. Following the ordinary preparations the abdominal wound was reopened and the liver raised out of the abdominal opening as much as possible. Without much trouble it was found that the junction of the cystic, hepatic and the common ducts had been resected in removing the gallbladder and that both the distal and proximal ends had been tied (Fig. 1). The stumps were separated about 1½ inches. A rubber covered clamp was placed on the hepatic duct and the knots cut. In cutting the ligature of the hepatic duct, I accidentally slit that tube and repaired it with one silk suture. The ends of the duct were now approximated and held in place by traction sutures. As the rubber clamp on the hepatic duct interfered with the work, I removed it, and to my surprise only a small amount of bile escaped. The ducts were united with a fine running silk suture. The posterior edges were inverted and the anterior, everted (Fig. 2) and covered with omentum. A rubber tube was placed in close proximity to the anastomosis held by a catgut stitch to the duodenum. The abdomen was closed in layers. The patient left the table in good condition.

Postoperative History.—The first ten days were uneventful. The third day the patient had her first bowel movement, passing bile colored stool. The tenth day there was a discharge of bile through the tube. This biliary fistula remained open until August 20. The jaundice quickly disappeared, and in a few bowel movements the stool looked normal in color. The patient left the hospital, August 1. A reexamination was held, December 15. The patient had gained a few pounds' weight, and seemed in good condition. There was no sign of jaundice.

30 North Michigan Avenue.

MULTIPLE CHANCRES OF THE LIP

ERWIN P. ZEISLER, M.D.

CHICAGO

This case of double extragenital infection with the *Spirochaeta pallida* is of unusual interest because of: (1) the rarity of extragenital chancres in the colored race, and (2) the simultaneous inoculation of the lower lip at two symmetrical positions, producing a double chancre and a bilateral submaxillary bubo.

REPORT OF CASE

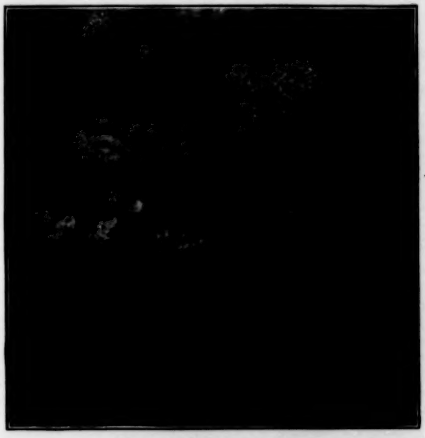
History.—Miss G. F., aged 19, colored, came to the dermatologic department of Northwestern University Medical School, March 21, 1917, presenting two lesions on the lower lip. She stated that five weeks before she had first noticed two small, hard "sores" on the lip which grew rapidly to their present size. The swollen glands on the two sides of the neck developed shortly after the lesions on the lip. There was no pain at any time. During the past two weeks she had had headache, slight sore throat and malaise. On close questioning the patient admitted that she had been kissed repeatedly in the past few months by a colored man with a sore lip.

Physical Examination.—There were two cherry-sized protuberant masses on the lower lip, symmetrically placed on either side of the midline, of approximately equal size, each one about three-fourths inch in diameter and extending from the cutaneous edge across the vermilion portion of the lip. Both nodules were indurated, and the surface was excoriated, covered with reddish-brown crusts, and exuded a bloody serum on pressure. The entire lower lip was somewhat edematous; the upper lip was unchanged. A bilateral submaxillary bubo was present. The glands on the right side of the neck were somewhat larger than those on the left. There was generalized adenopathy, with marked enlargement of the posterior cervical and occipital chains. The mouth showed an angina involving the pillars and tonsils, but no mucous patches. A beginning typical macular eruption was faintly visible on the chest and the abdomen.

Laboratory Examination.—Spirochetes were demonstrated in secretions from both chancres in dark field and in smears. The Wassermann test was strongly positive.

COMMENT

A cursory examination of the literature on extragenital chancres reveals that chancres of the lip are the most frequent form of extragenital infection. Cole's[1] recent report of sixty-one extragenital primary lesions includes forty-three lip cases, of which thirty-two were on the lower and seven on the upper lip. Bulkley,[2] out of a total of 9,058 extragenital chancres, found that lip infections constituted 20 per cent. (1,810 cases). In his private practice he reports fifty lip chancres out of 113 extragenital lesions. Fournier[3] found that extragenital lesions comprised



Multiple chancres of the lip.

7 per cent. of all chancres, and that there were 567 lip cases out of a total of 1,124. These statistics are sufficient to show that the lip is a frequent site of infection with the *Spirochaeta pallida.*

It is stated that lip chancres occur more commonly in women than in men, and affect the lower lip in preference to the upper lip. Gaucher and Milian[4] in 1893 pointed out that the roseola appears earlier in lip chancres, probably because of the greater vascularity of the lip as regards both vessels and lymphatics. The initial lesion on the lip is usually single, and is frequently of such size as to push out the lip prominently and disfigure the face.

Multiple extragenital chancres, either of the lip or of other locations are, however, by no means common, although Osler[5] states that one fourth of all chancres

1. Cole, H. N.: Report of a Series of Sixty-One Extragenital Chancres, THE JOURNAL A. M. A., Dec. 16, 1916, p. 1805.
2. Bulkley: Syphilis in the Innocent, 1894, p. 39.
3. Fournier, quoted by Kingsbury: Dermochromes, New York, 1913.
4. Gaucher and Milian, quoted in Power and Murphy, A System of Syphilis, 1908, **1**, 195.
5. Osler: Modern Medicine, 1914, **2**, 155.

are multiple. A few cases of double chancre of the lip are on record, and occasionally the combination of chancre of the lip and tongue or chancres on both lips have been observed. Compared with the frequency with which we see multiple genital lesions, for instance, chancres of the corona glandis and the adjacent prepuce in the male and juxtaposed chancres of the labia in the female, double extragenital lesions are distinctly rare, although I recall a case of double chancre of the cheek which I saw a few years ago. It is generally accepted that unless inoculation is simultaneous at two points, a superinfection does not take place. An adjacent surface does not become infected by contact with the secretions of the primary lesion. Most authorities agree that by the time a chancre is recognized, there is immunity against the production of fresh primary lesions. On the other hand, certain French authors contend that successive chancres may occur, that is, multiple chancres which develop at considerable intervals of time from each other. The cases cited in support of this view are not absolutely conclusive. In our case one would assume from the identical size of the two lesions that the lip had been inoculated simultaneously at two points.

Statistics show, furthermore, that extragenital chancres are not nearly so common in negroes as in white persons, for reasons that are not entirely clear. Hazen,[6] in over 3,000 cases of syphilis in the colored race, reports only three extragenital chancres. In view of the frequency of syphilis in the colored race, Reasoner[7] suggests that possibly there exists in the negro outside of the genitalia (as practically exists in the rabbit) the power of tissue defense or reaction to initial syphilitic infection. On the other hand, in the discussion of the symposium on syphilis[8] at the 1916 session of the American Medical Association, extragenital immunity was not considered an adequate explanation, and it was suggested possibly that the negro spends less time in amatory preliminaries. Nevertheless, statistics seem to show that extragenital lesions are far less common in negroes than in white persons.

30 North Michigan Avenue.

6. Hazen: Extragenital Chancres, Interstate Med. Jour., August, 1916, p. 661.
7. Reasoner, M. A.: Some Phases of Experimental Syphilis, THE JOURNAL A. M. A., Dec. 16, 1916, p. 1799.
8. Abstracted in THE JOURNAL A. M. A., Dec. 30, 1916, p. 1989.

Effect of Fires on Food Supply.—With an average of one reported fire for every minute in the year and a daily destruction approximating nearly $600,000, according to the National Board of Fire Underwriters, the fire loss in the United States constitutes a not inconsiderable item in the high cost of living. This waste, which is largely preventable, has to do to a great extent with the food problem. For example, it is said that a recent blaze in an Illinois elevator destroyed 700,000 bushels of corn and 300,000 bushels of oats. Grain elevators, flour, cereal, grist and feed mills, on account of the explosive dust that accumulates in them, are especially subject to fires, and these with individual barn fires and crop fires due to lightning, railroads and many other causes, are a source of tremendous loss of food products. Food is only one item of the tremendous loss from fires, and in addition to the loss of material property, the interruption to business and employment adds greatly to the total. It seems that fire losses in the United States are greater than those of other countries. The actual figures of the underwriters show that 21.4 per cent. of this loss from fires is due to strictly preventable causes, 37.9 per cent. to causes which are partly preventable, and the remaining 40.7 per cent. of fires from "unknown" causes are probably largely preventable.

Clinical Notes, Suggestions, and New Instruments

A SIMPLE ANESTHETIC APPARATUS FOR LABORATORY USE*

BERNARD FRANCIS McGRATH, A.B., M.D., MILWAUKEE
Professor of the Principles of Surgery and Director of the Surgical Laboratory, Marquette University, School of Medicine

This apparatus is a modification of one presented by me[1] in 1914. The modified apparatus is a considerable improvement over the original. It is easily and quickly adjustable

Fig. 1.—Apparatus adjusted for automatic anesthetization and resuscitation: 1, ether can; 2, small opening in top; 3, regulator of anesthetic; 4, connection for tube holder; 5, interrupter for resuscitation; 6, intratracheal tube; 7, intrabuccal tube; 8, mouth gag.

for automatic anesthetization, intrathoracic pressure with anesthetization, and resuscitation. The principles applied are not new: similar principles are involved in the apparatus of Meltzer and Auer, Corbett and others.

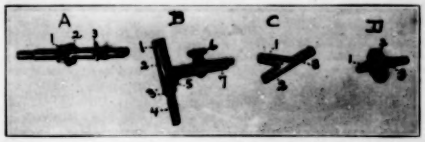


Fig. 2.—Parts of apparatus: *A*, resuscitator: 1, interrupter (pressed forward, air current; pressed backward, shut-off; 2, opening for expired air; 3, shut-off when resuscitator is not in use; *B*, Regulator of anesthetic: 1, air exit; 2, outlet valve (expiration); 3, inlet valve (inspiration); 4, for fixing in ether can, to be covered with rubber tubing; 5, ether valve; 6, air valve; 7, for rubber tubing connection with Y. *C*, Y for double connection with regulator and resuscitator: 1, for resuscitator; 2, for regulator; 3, for rubber tubing connection with tube holder; *D*, tube holder: 1, for rubber tubing connection with Y; 2, guard against tube slipping, fixed with bandage or mask; 3, for connection with intratracheal or intrabuccal tube.

Fig. 3.—Apparatus adjusted for intrathoracic pressure with anesthetization: 1, air current, with interrupter (for resuscitation) inserted in tube; 2, air current passing through anesthetic reservoir; 3, anesthetic reservoir, substituted for the ether can (Fig. 1); 4, regulator of anesthetic; 5, regulator of degree of intrathoracic pressure (safety device against undue pressure); 6, intratracheal tube.

In my routine for administering ether in the laboratory, surgical anesthesia is induced in a cabinet by heated ether forced in by compressed air. The average time for this is about four minutes. The animal is then fixed on the operating table and an intratracheal tube (Fig. 1, *6*) quickly introduced. The introduction of the intratracheal tube may be facilitated by

* From the Surgical Laboratory of Marquette University, School of Medicine.
1. McGrath, B. F.: Anesthesia in Surgical Research: A Simple, Economical and Efficient Apparatus for Ordinary Routine Work, Surg., Gynec. and Obst., 1914, **18**, 765.

means of the mouth gag (Fig. 1, *8*). The entrance of air through the nose and the mouth is completely excluded with cotton and a bandage, or a close fitting mask. The metal tip (Fig. 2, *D*, *1*) of the tube is then connected with the apparatus, and the necessary admixture of ether and air regulated by means of the valves (Fig. 2, *B*, ether valve, 5; air valve, 6). The opening (Fig. 1, *2*) in the top of the ether can is uncovered. In case of respiratory failure, both the ether and the air valves are closed, the valve situated in front of the interrupter (Fig. 2, *1*) of the resuscitating device is opened, and artificial respiration produced by pressing the lever of the interrupter forward for inspiration, and backward for expiration through the opening (Fig. 2, *A*, *2*). Either a foot bellows or the piping of the laboratory may be used for compressed air. When intrathoracic pressure with anesthetization is required, a two-mouthed glass bottle (Fig. 3, *3*) is substituted for the ether can. The outlet valve of the regulator (Fig. 2, *B*, *2*) is removed by unscrewing the cap. The tube for the air current (Fig. 3, *1*) is applied at this point. The tube for the ether current (Fig. 3, *2*) is attached. The interrupter for resuscitation is in the air current tube. A safety valve (Fig. 3, *5*) for regulating the degree of intrathoracic pressure is introduced, as shown in Figure 3. The ether valve and the air valve of the regulator are adjusted for the required admixture of ether and air. An intrabuccal tube (Fig. 1, *7*) may also be used for anesthesia.

Experience has proved that this apparatus and method are convenient, effective and reasonably economical.

SPOROTRICHOSIS: REPORT OF A CASE

A. A. Spoor, M.D., Lansing, Mich.
Bacteriologist, State Board of Health

This is the first case of sporotrichosis reported from Michigan. R. L. Sutton says:

There are many busy practitioners who have never even heard of sporotrichosis. For this reason, I believe that all recognized cases of the affection should be reported, during the next few years at least, in order to disseminate as widely as possible a knowledge of its symptomatology.

Therefore I wish to report a case which came under my observation.

March 11, 1917, Dr. M. R. Morden of Adrian, Mich., wrote me to this effect:

Enclosed find discharge from a small, deep furuncle over enlarged cervical glands. The patient, J. W. P., is an athletic young man, aged 18. Crop after crop of small boils on an area the size of his hand have been occurring in the spot mentioned for a few months, some of them like boils, others like scrofuloderma—tuberculosis cutis. The hard swelling existed some months before the eruption over it occurred. Please report findings.

The small, subcutaneous boils, together with the enlargement of the neighboring lymph glands, and the duration of the disease, showing a lack of response to ordinary surgical treatment, led me to think of sporotrichosis. I inoculated slanted glucose agar tubes with some of the discharge, and in three days at room temperature the sporothrix developed as white colonies and later became markedly pigmented with black pigment, forming large, flat, black colonies with marked striations. The growth is not nearly so rapid as that of the *Aspergillus niger*, and the mycelial filaments do not grow up from the media (aerial) like the *Aspergillus niger*.

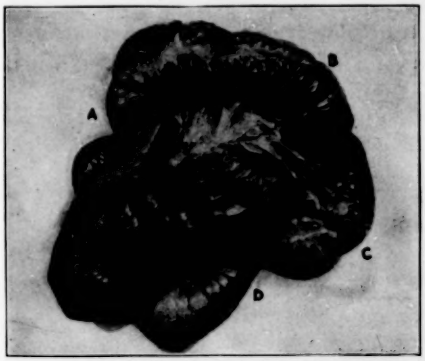
Schenck in 1898 first described this parasitic mold, which he found in the lesions of a peculiar disease, beginning as a localized ulcer, with later involvement of the neighboring lymph glands, in which cold abscesses formed and opened to the exterior. A second similar case was described by Hektoen and Perkins. Since its discovery, a large number of cases have been identified in all parts of the world, and especially in the middle western portions of the United States. The lesions in this condition resemble, at times, those of tuberculosis, while, occasionally, they appear more like those of syphilis. The chief characteristics are the sharply defined, painless cutaneous or subcutaneous abscesses, which are small and which follow the course of the lymphatics, together with enlargement of the neighboring lymph glands, and they do not yield to the ordinary surgical prodecures. Many of the cases occur on the extremities.

AN UNUSUAL CASE OF INTESTINAL INTUSSUSCEPTION

F. A. Van Buren, M.D., Omaha

An infant, aged 5 months, admitted to the hospital, Dec. 2, 1915, at 4:30 a. m., five days after the onset of illness, had been well up to this time. The child was bottle fed, and the modified cow's milk had apparently agreed with the child up to just prior to the illness, when the stools contained considerable curds. The onset was sudden. The child became restless from evident intestinal disturbance. The bowels moved some the first day, the last movements containing blood and mucus. On the second day, calomel was given, and 2-dram doses of castor oil every two hours for several doses. The child began to vomit, but no more bowel movements resulted. The child became rapidly worse, when on the fifth day it was brought to the hospital in a dying condition.

The child was well developed, of apparently normal weight, unconscious and restless. Respiration was of the Cheyne-Stokes type; the pulse could not be counted. The abdomen was distended. A tumor could be felt in the abdomen extending transversely between the iliac spines. Pressure on this tumor produced a friction rub. The tumor was palpable through the abdominal wall. Owing to the seriousness of the infant's condition, no operation was performed, and it died after about three hours.



Condition as found postmortem: *A*, intussusception of ileum into cecum; *B*, transverse colon; *C*, descending colon; *D*, ileum.

There were no special features in the history, symptoms or course of the illness, differing from the classical picture of intussusception of the bowel in infants.

The postmorten examination of the abdominal contents confirmed the diagnosis, but we were surprised to find a double intussusception, of the ileum into the cecum for a distance of about 10 cm., and of the distended descending colon over the collapsed sigmoid for about the same distance. The peritoneum was dry and had lost its luster. The ileum was dark and congested, and contained much gas and fluids. The neck of the ileocecal portion was tight, and grasped the intussusceptum so firmly that reduction was impossible without cutting. It was covered by a plastic exudate. The portion of colon between the proximal and distal obstruction was rather normal in appearance except for the lusterless appearance of the peritoneum. The intestine was much distended with gas and fluids. The distal intussusception was also covered at the neck by plastic exudate. The distal colon and sigmoid were collapsed. In order to preserve the specimen without mutilation, the intussuscipiens was not opened to examine the intussusceptum. No doubt this was gangrenous, as is common. Some speculation was indulged in as to which was the probable primary intussusception. We decided the ileocecal was the primary one and that the purgatives had produced the second.

SOME INSECTS AND REPTILES ON THE BORDER

JAMES COUGHLAN, M.D., NEW YORK
Lieutenant, Medical Corps, Second New York Field Artillery, National Guard

When the national guard of the northern states reached the Mexican border on and about the first part of July, the natural and climatic conditions encountered were entirely new and unusual to men unaccustomed to that type of outdoor life. In the section called the "Magic Valley," embracing the towns of McAllen, Mission City and Pharr, where the New York guard was stationed, the country is arid and one of the most barren regions of the south. Cactus, mesquite and sage, with Spanish bayonets and daggers scattered here and there, comprised the only growth that flourished. Vegetation and grass were so sparse, more especially in the dry weather, that animals required an extensive area for grazing. One of the interesting features was the variety of insects and reptiles injurious or poisonous to man. During the earlier days, there were many tales told of the "deadly" rattlesnakes, centipedes, tarantulas, spiders and others that had never been heard of before and never will again. In the course of a six months' stay in that region, a small amount of practical and personal knowledge of the subject was gleaned.

Most bites and wounds were received during the earlier months of July and August, owing possibly to the site of encampment on ground that was infested with insects, the fact that those months were very hot and animals seemed to

Fig. 1.—Scorpion.

Fig. 2.—Tarantula.

be more predatory, and because of the limited protection at that time. The number of bites received depended more on the location than on the mobility of the unit. If a camp was made in the midst of a cactus-mesquite-sage field, the bites were more numerous than on a plain. More men suffered from insect wounds and snake bites for a given period of time at our base camp on the outskirts of McAllen, than for the same period of time on the plains of Palo Alto.

Red ant bites were numerous, and when a person was bitten in a number of different places an annoying irritation and smarting sensation was produced. Tincture of iodin painted over the area relieved the condition in a few minutes.

Scorpions (*Scorpionidea*), of the *Arachnida* group, caused many troublesome bites. Scorpions vary in length from 1 to 4 inches, and are composed of a cephalothorax united to the abdomen by a broad base, the body elongated and plainly segmented and narrowing to a tail containing a vesicle with a sting. Two palpi emerge from the cephalothorax, one on each side, and end in two pairs of claws. They have about eight eyes and the same number of legs. A small white area resulted from the bite which required, as a rule, several applications of tincture of iodin.

Of the many varieties of spider bites, the most severe was that caused by the tarantula (*Theraphosidae*), of the *Arachnida* group. These vary in length from 1 to 5 inches, with the body and legs covered with long, black hair, and are slow in moving but quick to strike. They produced white, raised, swollen areas, about an inch in diameter with a smarting, stinging sensation. The earlier bites were treated with iodin, but later more instant relief was obtained from the use of equal parts of spirit of ammonia and water applied as a wet dressing. No constitutional effects were seen.

Centipedes (*Chilopoda*), of the group *Myriapoda*, were not so numerous. The largest, seen in the possession of a Texan, was 6 inches long. Each of its many segments has a pair of legs, and the poison comes from a large pair of jaws under the head, which is developed from the second pair of legs. Two bites were seen and quickly incised and drained and a wet mercuric chlorid dressing applied. No constitutional symptoms resulted.

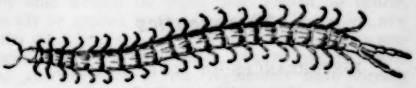


Fig. 3.—Centipede.

The Texas rattlesnake (*Crotalus atrox*) and the diamond rattlesnake (*Crotalus adamantcus*) are so similar that the term "Diamond-backed" is commonly applied to rattlesnakes in Texas. It seems to be questionable whether or not they belong to separate classes, though the shapes of their heads differ and the Texas rattlesnake is not so good a swimmer as the diamond rattlesnake. The latter lives in the southeastern part of this country, from Florida north to the Carolinas and west to the Mississippi Valley. The Texas rattlesnake occurs in the arid portion of Texas, parts of southern New Mexico, Arizona and northern Mexico. They are frequently seen in cactus fields; the largest was 7½ feet in length with fourteen rattles, and its skin is now in the possession of Capt. Louis Kuntz of the Second New York Field Artillery. The rattles end in a cone-shaped cup or button. The snake's projectile range is about one third of its length, and its striking range about one half its length, accompanied by a forward thrust of the head and neck. It is possessed of movable fangs at the anterior end of the upper jaw which are erected coincidentally with the forward thrust. Pressure by the muscular apparatus of the jaw causes an expulsion of venom from the poison sac along the unsheathed fangs and into the wounds. As the fang points frequently diverge, it is a combination bite and blow, the wounds usually being larger than similar incisions from curved needles. The wounds are about five-eighths inch apart and from one-half to three-quarters inch in depth, accompanied by a small amount of bleeding.

Six cases of rattlesnake bites came to my attention, varying in severity, the most severe occurring in a "guard" who had captured the snake with a forked stick, and insisted on picking it up with his bare fingers. He received a bite on the middle finger of the left hand, the fangs penetrating to the bone, and was seen about five minutes after the occurrence.

Fig. 4.—Texas rattlesnake.

The finger was swollen, the fang marks plainly visible, with a little dark red blood oozing from the two openings. A tourniquet was applied over the upper arm, and two incisions about 1½ inches long made over each fang point, which allowed about 2 ounces of dark red blood to flow. Five per cent. tincture of iodin was painted in the wounds, and the fingers, forearm, and arm bandaged with a mercuric chlorid wet dressing. The tourniquet was loosened and tightened every twenty minutes for two hours. The entire arm up to the tourniquet became swollen about one and a half times its normal size with a bluish-red discoloration, somewhat painful, and causing considerable anxiety to the patient, but no

constitutional symptoms. Repeated mercuric chlorid applications were made, and strychnin sulphate, one-thirtieth grain, given by mouth and repeated in half an hour. Aside from slight stiffness in the bitten finger, the patient made an uninterrupted recovery.

In five other cases, from five to twenty minutes elapsed between the time of the rattlesnake bites and the time they were treated, and all the patients recovered without any serious manifestations.

719 West One Hundred and Eightieth Street.

Therapeutics

DISTURBANCES OF THE KIDNEYS

(Continued from page 1478)

HYDRONEPHROSIS

This condition—a dilatation of the renal pelvis—can occur only as the result of some obstruction in the ureter. Such an obstruction may be due to an impacted calculus, a coagulum of blood, congealed pus, some tumor growth pressing on the ureter, a twist of the ureter caused by looseness of the kidney, or to long continued distention of the bladder. An obstructed ureter will rarely be found as a congenital condition. The longer such a dilatation of the pelvis of the kidney continues, or the more frequently such a condition occurs, the greater the injury to the kidney structure. Frequently, if the pressure of urine in the kidney becomes sufficiently great, it will either straighten a twisted ureter or dilate the ureter around an obstruction, and the kidney will empty itself into the bladder. If the calculus or other obstructive substance plugs the orifice of the ureter and is soon displaced, dilatation of the pelvis may not occur and such plugging may not recur although the calculus may still remain in the pelvis of the kidney. Any sudden obstruction or a twist of the ureter does not always lead to dilatation of the kidney pelvis, as the associated kidney congestion and a diminution of the excretion of urine sometimes prevents this. Repeated obstruction, however, will generally cause a hydronephrosis.

Anything that causes prolonged distention of the bladder, whether due to an enlarged prostate or to some urethral obstruction, may cause a hydronephrosis of one or both kidneys. A readily movable kidney may have a more or less dilated pelvis, even when Dietl's crises do not occur, although in this condition alone real hydronephrosis does not often occur. A gradual dilatation of the pelvis of the kidney may cause an abdominal discomfort from the weight and pressure on the adjacent organs, but perhaps no real pain. The polyuria following a Dietl's crisis is due not only to the outflow of retained urine in the pelvis of the kidney, but also to an increased secretion from the irritated kidney.

Hemorrhage into the pelvis may cause its dilation and a subsequent distention from plugging of the ureter. Such blood may come from a tumor, or from varices in the pelvis or calices of the kidney.

When the flow of urine is suddenly obstructed, shock may occur, as in renal colic, and the temperature may rise, as it usually does when the obstruction is caused by a plug of pus from a pyelitis or from a coagulum from a bleeding kidney. The more serious the cause of the obstruction, the more frequent become the attacks of acute hydronephrosis, pain, etc.

Urinary signs ordinarily do not occur when external pressure or a twisted ureter is the cause. If there are renal calculi, if the kidney is bleeding, or if there is pyelitis, the urine will show blood, or pus, or both.

There may be no absolute obstruction to the flow of urine, and yet the conditions may cause sufficient damming back to produce a dilated pelvis. This condition is discovered by cystoscopy, the passage of the ureteral catheter and by ascertaining how much fluid the pelvis will contain. Long continued irritation of a ureter may cause sufficient narrowing to prevent the passage of a ureteral catheter; or a constricted ureter may be congenital.

The sensation of pain when fluid is injected into the pelvis of the kidney will indicate when the pelvis is full. Although there is a difference of opinion as to the amount of liquid a normal pelvis should contain, it is probable that anything over an ounce (30 c.c.) should be considered abnormal.

While a large hydronephrosis may ordinarily be diagnosed by physical signs and symptoms, pyelography, the injection into the pelvis of the kidney of a solution that will give definite roentgenographic pictures, will positively determine the size of a kidney pelvis, and the relationship of an abdominal tumor to the kidney.

That any obstruction which causes a hydronephrosis may seriously impair the kidney structure has been shown experimentally, and Keith and Snowden[119] found that experimental hydronephrosis soon caused albuminuria, decreased phenolsulphonephthalein and lactose excretion, and increased the nonprotein nitrogen of the blood, causing renal insufficiency. Death may result from this condition, unless the other kidney is in perfect health. It should also be recognized that a hydronephrotic kidney may readily become infected.

The kidney probably becomes painful only when its pelvis is irritated, or when there is an irritation near its capsule. Consequently, disturbances located in the secreting kidney substance are rarely painful. One of the most frequent causes of kidney pain is distention of the pelvis perhaps by a calculus. Just how much distention the pelvis may tolerate without pain may be variable, but as previously stated, more than an ounce of fluid, sometimes less, will cause kidney ache, if not actual kidney pain. The patient may get relief at night from kidney pain due to pelvic distention or pelvic irritation only by lying on the affected side, so that the respiration will not cause as much movement of this kidney. Kidney pain and distress, accompanied by a diminished amount of urine, followed by the passage of a large amount of urine with relief from distress, points strongly to obstruction of the ureter and a dilatation of the kidney pelvis.

At first such pain is referred to the lumbar region, and a tender point is discovered between the last rib and the erector spinae muscles, the point of tenderness being about the size of the end of the thumb. This pain is stabbing and severe, and may cause vomiting. As the kidney pelvis distends more and more, there is more general abdominal discomfort, and the pain and ache is diffused over the whole side and lumbar region. As the pelvis reaches its full capacity, distress is referred to the abdomen, more, of course, on the affected side, and the symptoms become more like those of renal colic; but the acute obstruction is likely to be shorter than that of a renal colic as the

119. Keith, N. M., and Snowden, R. R.: Functional Changes in Experimental Hydronephrosis, Arch. Int. Med., February, 1915, p. 239.

fluid forces its way downward. The pain is increased on standing up by the drag of the heavy kidney, and is lessened on lying down. The pain may be as agonizing in Dietl's crisis as a renal colic. The pain, if right sided, may be referred to the gallbladder region, to the appendix or to the pelvis, and render diagnosis difficult, at least while the pain is acute. But a tumor in the kidney region, or a movable tumor, with the history of the case, will generally prevent an unnecessary immediate operation. In a doubtful case the patient should be anesthetized and a ureteral catheter passed to ascertain whether there is an obstruction and whether relief can be given. The diagnosis can thus be cleared.

It is self-evident that recurring dilatations of the pelvis of the kidney or more or less permanent hydronephrosis should not be allowed to occur as the kidney structure may become permanently diseased, pyelitis may result, and the kidney may become useless. It should also be remembered that serious irritation or inflammation of one kidney cannot occur without danger of involving the other kidney.

Of course it is recognized that when the abdomen is fat, ordinary physical examinations and even ordinary roentgenograms of the abdomen may not make the diagnosis clear, and that cystoscopy, ureteral catheterization, pyelography, and perhaps even exploratory laparotomy are necessary to make the diagnosis positive.

(To be continued)

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

SOFOS.—A mixture of sodium dihydrogen phosphate and sodium hydrogen carbonate (sodium bicarbonate), rendered stable by coating the particles of one of the constituents with disodium hydrogen phosphate. One part of sofos has the same phosphate value as 1.75 parts sodium phosphate, U. S. P.

Action and Uses.—When sofos is treated with water, sodium phosphate (Na_2HPO_4) is formed and carbon dioxide is set free. (The reaction does not go to completion, some sodium dihydrogen phosphate remaining; but this is not considered important, as primary phosphate is also formed when sodium phosphate is taken into the acid gastric fluid.) Sofos has the physiologic action of sodium phosphate. It is claimed to have an advantage over the effervescent sodium phosphate preparations in that it is free from citrate or tartrate.

Dosage.—For adults, from 5 Gm. to 15 Gm. (from 1 to 4 drachms) in a glassful of water, taken before effervescence ceases.

Manufactured by the General Chemical Company, New York City. U. S. patent No. 1,037,078 (Aug. 27, 1912; expires 1929) and No. 1,150,901 (Aug. 24, 1915; expires 1932). U. S. trademark applied for.

Sofos is a white powder, having a slightly acid taste. It is permanent in dry air. On the addition of water, effervescence occurs with formation of secondary sodium phosphate and evolution of carbon dioxide. (When treated with water at room temperature, about 70 per cent. of the available carbon dioxide is liberated; when treated with human gastric fluid, about 93 per cent. of the available carbon dioxide is set free.)

Assay.—Dissolve about 0.5 gm. of sofos, accurately weighed, in 100 Cc. of water, and, after effervescence ceases, acidify with a small excess of hydrochloric acid. Boil the solution until the carbon dioxide is removed, cool and render ammoniacal. The phosphorus content is then determined in the usual manner, weighing as magnesium pyrophosphate. The amount of phosphate radical (PO_4) present should not be less than 46 per cent.

Special Article

THE MEDICAL OFFICER OF THE ARMY

VI

FIELD SERVICE REGULATIONS

These regulations are solely for the government of the army in time of war, while at maneuvers or in other exercises simulating warfare. Regulations of any kind written for peace times cannot, of course, readily be applied to war conditions. Therefore, new rules must be prepared. If these rules have been prepared before war takes place, officers entrusted with the carrying out of the regulations have already become familiar with them. The rules have the same interest to the medical officer as to the line officer, and the subject requires careful consideration by every one on his entrance into the service.

These regulations will be discussed as they are arranged in the "Field Service Regulations." The first chapter treats of the land forces of the United States. According to the present laws these land forces consist of the Regular Army, the National Guard and any other forces called into service in time of war. These forces are divided into the mobile army and the coast artillery, the mobile army consisting of troops which are to be used in actual field operations, and the coast artillery of special troops for service in manning the coast fortifications of our country.

THE DIVISION

The unit of the mobile army is the division. It consists in round numbers of 28,000 men, and is a self-sustaining unit in that all branches of the service are represented and each branch takes its proper position. In each division are nine regiments of infantry, two of field artillery, one of cavalry, one of engineers, one battalion of signal corps, four ambulance companies, four field hospital companies, and the proper supply trains. Three or more of these divisions may be formed into an army corps under the control of a corps commander. Though the coast artillery is not a part of the mobile army, certain regiments, preferably of infantry, may be detailed as coast artillery supports. Their duty is to protect the fortification from attacks by landing parties while the coast artillery itself is serving the guns of the fortification.

TABLES OF ORGANIZATION

The details of the formation of the different parts of the division and the field army are laid down in the "Tables of Organization." These give the personnel and transportation of all regiments, battalions or other units, with their proper distribution.

MILITARY INFORMATION

The next chapter treats of military information. While this information is primarily of interest to the line, and relates to the enemy, his strength and location, still, for the proper handling of the medical department in the field, the service of the channels of military information is necessary. It is important, first, to obtain reliable information in regard to the local resources of the towns and cities with reference to their ability to accommodate large numbers of sick

and wounded, and to furnish medical supplies in sufficient quantity; also to obtain a knowledge of the roads, railroads, and the general sanitary condition of the territory in which operations are conducted. This information is obtained by air and cavalry reconnoissance in addition to the services of spies and secret agents.

From a medical standpoint, the cavalry reconnoissance work is especially interesting. This cavalry may be independent of the division and serving directly under the corps commander, or it may be divisional and a part of the cavalry regiment assigned to each division. From the nature of the work it can readily be understood that great difficulty is encountered in properly caring for and evacuating the wounded. Medical officers and sanitary troops are with each cavalry regiment, but no ambulances can be depended on to keep up with a rapidly moving mounted command. Any wounded must therefore receive first aid and then be left at some farmhouse or other convenient place until removal farther to the rear. The wounded are made as comfortable as possible, and, if necessary, an enlisted man is left with them to administer to their wants until they are taken in charge by the sanitary personnel of the foot troops marching in rear or are picked up by the cavalry on its return.

THE ADVANCE GUARD

With all moving commands, security is an important factor. If the command is advancing, advance guards are provided. The advance guard consists of from one twentieth to one third of the entire command. The larger the command the larger the advanced guard in proportion to the total force. A division, for instance, has an advance guard consisting normally of one brigade — three regiments — of infantry, one battalion of artillery, one squadron of cavalry, one company of engineers and one ambulance company. This is known as a reenforced brigade, and marches a mile or more in front of the main body. The advance guard is divided into three parts: the advance party, consisting of a few men thrown out in front, the support and the reserve, the reserve containing the major portion of the advance guard and being its rearmost portion of the advance guard. The ambulance company, which is usually minus its transportation, this having been left back with the trains, follows directly in the rear of the reserve. The necessity of having an ambulance company in this location is great. The advance guard frequently becomes engaged long before the main body can be placed on the firing line. Therefore some assistance greater than that furnished by the regimental detachments must be provided. The ambulance company so assigned will establish a dressing station, if necessary, and as long as required, and rapidly collect the wounded so that their further evacuation can be facilitated.

THE FLANK GUARD

When a command is moving in such a way that the enemy is liable to attack their flank, a flank guard is used to protect the column. This flank guard may consist of any number of men, and has with it its proper proportion of sanitary troops on the basis, as a rule, of one ambulance company to a brigade. This ambulance company follows in the rear of the last combatant unit of the flank guard, and in case of engagement, will act in the same way as the ambulance company assigned to the advance guard.

THE REAR GUARD

When a command is retreating and a rear guard is formed, sanitary assistance must also be provided. Wounded occurring in an advance guard engagement can be more readily handled than the wounded occurring in rear guard engagements. The main body in the former is coming forward, and the regular divisional evacuation service can take care of them; but with the latter the whole command is retreating, and if the wounded are not carried with them they will fall into the hands of the enemy. Therefore, not only must this ambulance company with the rear guard have its ambulances with it, but also, if heavy fighting is liable to occur, more than one ambulance company to a brigade will sometimes be necessary. The wounded are succored and rapidly placed in the ambulances to be removed farther to the rear.

THE FIELD ORDER

General and special orders have been explained in these articles, but a type of order used only in the field is outlined here. This is called a field order and has a certain, regular form. It is, as a rule, divided into five paragraphs. The first paragraph gives information of the enemy and of our own troops that the commander desires to publish. The second gives his general plan of operations. The third specifies what each combatant unit of his command is to do. The fourth outlines the specific duties of the sanitary troops, and the location of the supply trains. The fifth shows where the commander himself can be found.

CONDUCT OF MARCHES

The next chapter of the "Field Service Regulations" outlines the conduct of marches. From a sanitary standpoint, marches are of great interest. In the first place, the sanitation of the area through which the march is conducted must receive attention from the medical officers. The habits of the men, water supply, and disposal of wastes while on the march are problems of more or less gravity, and if time permits, the greatest care is necessary to see that the men themselves are kept in the most perfect physical condition possible. With an infantry command, the feet of the soldier must be looked after carefully. Before the march takes place, a foot inspection is held to eliminate those unable to stand the hardships of the march and to correct any defects noted. After each day's march, any sore feet must be promptly treated so that as few men as possible will have to drop out. Furthermore, the care and evacuation of the sick occurring during a march constitutes sometimes a problem of great gravity. While the command is in motion, all men taken sick are permitted to leave the ranks and are picked up by the ambulances following behind. When the movement is not in the presence of the enemy, ambulances are distributed throughout the command in the proportion of one to a regiment, and this ambulance follows directly behind the unit to which it is assigned. When camp is reached immediate arrangements must be made for the care of these sick and also any sick that may occur during the stay at

this camping place. This, of course, is placed in the hands of a field hospital company specially detailed for the purpose, but it is not contemplated that this field hospital should pitch its tentage. Some farmhouse or other building suitable for the purpose and conveniently located is taken over as a temporary hospital, and only such supplies as are absolutely necessary for the care of the sick are unpacked from the wagons. When the command moves off the next day, the field hospital company does not remain, but leaves only sufficient personnel to care for the sick until the service of the line of communications can come forward and remove them to hospitals in the rear.

SANITATION OF CAMP SITES

The usual march, whether in peace or in war, begins early in the morning; and before the command leaves camp it is the duty of the medical officers attached to see that the sanitary condition of the camp site is satisfactory. It must be understood that in war operations camp sites may be occupied by a number of different commands, one after another, and that their sanitary condition must be good at all times.

RATE OF MARCH

The rate of march for infantry or any other foot troops is from 2¼ to 2½ miles an hour, and the length of the average daily march is 15 miles; but with large bodies of troops, consisting of a division or more, 12 miles a day is about all that can be accomplished. After the command has been on the road for an hour, a halt of from fifteen to twenty minutes is allowed so that the men can attend to the calls of nature. As a rule, during every succeeding hour a ten minute halt is allowed.

POSITION OF THE SANITARY UNITS

When a division is on the road, the sanitary units are assigned to a regular position in the line of march. One ambulance company, as has been shown, accompanies the advance guard; the other three companies follow the last combatant unit of the main body. The field hospital companies are with the trains, and their position in the trains depends on whether the march is conducted in hostile territory or at a time when no fighting is expected. In the former case they precede all of the trains but the ammunition train; but in the latter case the field trains which contain the rations and baggage of the regiments come first, as they will be needed first, and the field hospital companies follow immediately after them.

CARE OF THE SICK IN CAMP

When camp is made, in addition to the question of camp sanitation, which must receive careful attention at all times, the care of the sick must also be provided for. It has been shown that a temporary hospital is established and the sick requiring hospital attention are moved to this hospital; but other arrangements must be made for those cases which require only slight attention. To do this camp infirmaries are established in the proportion, as a rule, of one to a brigade, and they are located at a point convenient to all of the regiments of this brigade. The camp infirmary is nothing but a small dispensary. A wagon is provided to carry its supplies and there is a noncommissioned officer in immediate charge of the equipment, but the personnel to look after the sick brought to this camp infirmary must be provided by the regiment which it serves. The sick are brought to the infirmary, and either receive treatment or are removed to the temporary camp hospital by an ambulance company detailed for the purpose.

SANITARY SERVICE IN COMBAT

Combat is offensive or defensive. The offensive combat may be either a rencounter engagement or a planned attack. In the rencounter the enemy is encountered usually first by the advance guard, and the other units of the command are fed into the battle line as required without any previously planned procedure. In the planned attack, on the other hand, the enemy's location is positively known and a regular plan is made beforehand for the entire attack. With either form of attack the ambulance companies are not used at once, but dressing stations are established only when required, and then where the wounded are thickest, and not equally throughout the entire command. In a defensive engagement, on the other hand, a different procedure can sometimes be followed. If a defensive position is taken with prepared fortifications and a determination to hold this position, dressing stations can be established beforehand and prepared for the reception of the wounded. This is the procedure that has been carried out in the fighting in Europe on the western front. If the engagement, whether offensive or defensive, has been unsuccessful, efforts must be made by the sanitary troops to remove all the wounded possible in the transportation at their command; but frequently this is impossible, and collections of wounded, or even entire field hospitals filled with wounded, must be left in the hands of the enemy. If this is done, sufficient personnel must be provided to care for these wounded until the enemy himself can take over the work. In case of a successful issue of the engagement, the police of the battlefield must receive attention. The removal of arms, ammunition, guns, etc., is naturally in the hands of the line, but the sanitary service must remove the wounded as rapidly as possible. If the fighting has been severe and the casualties heavy, the sanitary personnel may be insufficient for this work, and in that case assistance is requested from the line, and battalions or even regiments may be detailed to help in this work. It must not be understood that this assistance can be always counted on. Frequently the whole command rapidly moves off to the pursuit of the fleeing enemy, leaving the sanitary service to perform its duties as best it can. The dead are buried by line troops detailed for the purpose, but a medical officer is usually provided to see that this burial is done in a thoroughly sanitary manner.

(To be continued)

Extempore Speaking.—In Grant Duff's *Notes from a Diary* (1896 to Jan. 23, 1901) he records that he asked the Bishop of Ripon whether he had not very exceptional facility in extempore speaking. The bishop said, and with justice, that real extempore speaking is very rare; in nine cases out of ten what appears to be extempore has been prepared long before, and laid up unconsciously in the recollection. He went on to cite an answer made about a sermon which had struck one of the listeners very much. 'I wonder how long it took to prepare that sermon?" The answer was, "Fifty years."—*Brit. Med. Jour.*, Jan. 27, 1917.

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SATURDAY, MAY 26, 1917

EPIDEMIC MENINGITIS AND THE ARMY

Of the acute infectious diseases none is feared more than epidemic meningitis, and justly, because of the frightful death rate, to say nothing of the suffering and disability. Even under the most favorable circumstances, which means the prompt intraspinal use of potent antiserum, it has not been possible to reduce the death rate much below 30 per cent. Consequently the importance of prevention cannot be overstated. The conditions in military camps and garrisons clearly favor outbreaks among soldiers, as shown repeatedly in the course of epidemics, and most recently by the outbreaks among British and Canadian troops. About 1840 the disease was carried from one end of France to the other by the movements of a certain regiment of infantry in which the infection had established itself.[1] Like diphtheria, epidemic meningitis is spread by contact with the sick and with healthy carriers, and as the meningococcus carriers are always more numerous than the meningitis patients and move about freely (unless detected and detained), the carrier undoubtedly is the most important agent in spreading the disease. The presence of an occasional carrier among troops or under other conditions which bring people into close contact may result in the development of a large number of more or less temporary carriers of which a certain number for various reasons not clearly understood fall sick of the disease.

That carriers far outnumber the patients has been established by numerous observations: for example, of the sixteen room-mates of a soldier stricken with meningitis, ten were carriers; and recently in England as many as 400 carriers have been found at one time in large garrisons in which the development of cases of meningitis led to systematic bacteriologic examinations of the nasopharynx of large numbers of men. The occurrence of epidemic meningitis is thus direct evidence of the presence of carriers. Naturally, in crowded quarters, a long chain of carriers may be formed, link by link, and we realize the great importance of preventing the establishment of starting points for such chain carriers, any single one of which may convey the meningococcus to susceptible persons and be the means of setting on foot meningitis in previously nonepidemic places.

In England the spread of epidemic meningitis among soldiers (and through soldiers to the civilian population) has been combated with conspicuous energy and success. In addition to prompt isolation of patients, segregation and examination of all contacts with detention of those found to be carriers until free from meningococci have been carried out systematically and in some instances on a very large scale. For the purpose there was established a central laboratory and some thirty-seven district laboratories. One problem that arose was that of an efficient culture medium easily prepared in the large quantities needed. As the meningococcus requires for prompt growth certain special substances hitherto supplied by the use of ascitic fluid or blood, neither of which under the circumstances was procurable in sufficient quantities or sterile, the blood having the drawback also of making the medium opaque, Gordon and his associates solved the problem by working out a pea extract trypsin agar which answers the purpose satisfactorily.[2] In most of the carriers the meningococci disappear in a short time, but in some they persist longer, and interesting experiments have been made (Gordon and associates) on the effects of inhalation by carriers of nebulized disinfectants, chloramin in from 0.5 to 1 per cent. solution apparently giving the most promising results. The meningococcus is little resistant to disinfectants, but as it is found chiefly in the nasopharynx, the question is to reach all its parts. In making cultures, the posterior wall of the pharynx must be swabbed, and in Foster and Gaskell's useful book a special swab constructed for this purpose is described. These authors also give in detail the various points considered by British workers in the differentiation of the meningococcus from other gram negative cocci in cultures from the nasopharynx; but this question cannot be discussed further now except to mention that Gordon believes there may be four definite and permanent groups of meningococci determinable by agglutination with immune serum for each group. If this proves true, a great step in advance will have been made, not only in the diagnosis of cultures from the throat, but also, we may hope, in the preparation of potent immune serum for therapeutic purposes, in which case the determination of the particular group to which belongs the meningococcus concerned in the given instance of meningitis would have to be made by agglutination tests or other means in order that the proper antiserum might be injected. We know from earlier work that the meningococci fall into distinct groups, and it seems altogether reasonable that by following such grouping, improvements both in diagnosis and serotherapy may result.

1. Foster and Gaskell: Cerebrospinal Fever, Cambridge, 1916.

2. Gordon: Jour. Roy. Army Med. Corps, 1915, **24**, 455; Brit. Med. Jour., 1916, **2**, 673 and 678. Foster and Gaskell (Footnote 1).

The special object at this time is to direct attention to the situation in this country. Epidemic meningitis is now prevalent to an unusual degree in various places — in Philadelphia, Cleveland, St. Louis, Hartford, Minneapolis, New York, Chicago and elsewhere[3] — a matter of great importance in itself and of additional concern because we are about to establish a large number of training camps for soldiers. The question is, Are we as well prepared as we ought to be to prevent the spread of epidemic meningitis in our cities and communities and to keep it out of our military encampments? If not, steps should be taken immediately by civilian and military authorities to arrest the spread of the disease by isolation and proper treatment of the sick and by detection and confinement of all carriers until free from meningococci.

THE PITUITARY IN CHRONIC POLYURIA

To the publications of Sir Edward Schäfer and his collaborators in Edinburgh is due the widely published and generally accepted statement that extracts of the posterior lobe (including the pars intermedia) of the pituitary gland produce diuresis. The pituitary is also one of the few sources of substances reported to produce an increased flow of milk from the mammary gland. This alleged galactogogic function has, however, been challenged and denied,[4] and the experiments to ascertain the diuretic potency have given far from concordant results. The actual statements based alike on human and on animal experiments are frankly contradictory.

There are many evidences of some sort of connection between the pituitary body and renal activity, but the tradition of the diuretic effect has persisted as the expression of this relationship. Experiments by S. A. Matthews showed that in careful extirpation of the posterior lobe by Aschner's method[5] there results often an enormous polyuria, or diabetes insipidus. A dog of 4 kg. may secrete as much as 3 liters (quarts) of urine a day. This is not accompanied by any lowering of sugar tolerance, nor is the operation followed or accompanied by glycosuria.[6] This result of removal of pituitary function does not speak for a normal diuretic function on the part of the pituitary, but gives indications of a contrary influence. In harmony with it, K. Motzfeldt[7] has come to the conclusion that the pituitary body, as shown by its extracts, exerts a constant, physiologic influence on the functional activity of the kidneys in human beings. This action consists in a checking of the flow of urine — an antidiuretic effect which is most marked when the diuresis is high.

Motzfeldt's researches, carried out in the Laboratory for Surgical Research at the Harvard Medical School, indicate that the inconstant and conflicting results of the past in respect to the relation of pituitary extracts to renal function are attributable to unsuitable methods of study. After producing typical polyurias experimentally he was able to check them definitely with extracts of the pars intermedia and posterior lobe of the hypophysis, given orally, subcutaneously or intravenously. Extracts of the anterior lobe show a similar effect, but only to a slight degree.

This constant antidiuretic effect, which is independent of changes in blood pressure or intestinal absorption, is similar to that produced by beta-imidazolylethylamin (histamin), para-oxyphenylethylamin (tyramin), small doses of nicotin, large doses of caffein, and by extracts of the suprarenal cortex. These amins are at present believed to have a general stimulating effect on the sympathetic nervous system. The antidiuretic potency is practically absent in any attempt to check so-called salt diuresis. These facts are interpreted to signify that the antidiuretic action exerted by pituitary extracts, in the cases studied, is caused by the stimulation of the sympathetic nervous system, and that the renal vasomotor system in this respect is of chief importance.

For many years diabetes insipidus, or chronic polyuria, has been associated by clinicians with vasomotor disturbances. Motzfeldt believes that the new points of view formulated by his studies "bring the polyurias related to disorders of the nervous system and the polyurias of pituitary origin in closer contact." From the standpoint of the clinic one thinks at once of the possible use of the posterior lobe extracts in the management of suitable chronic polyurias — an application of organotherapy which has already been attempted.[8]

CONNECTIVE TISSUE CELLS AND PHAGOCYTOSIS

The importance of phagocytosis in the defensive reactions of the organism certainly has not become diminished through the newer investigations in the field of immunology. It is not only in the protective responses of the body against bacteria that the phagocytic powers of body cells are brought into play; they are said to accompany the involution of certain organs and to attend various atrophic changes in tissues, acting there in the capacity of scavengers which remove and destroy the discarded débris.[9] The phagocytosis exerted by some of the white blood cells is well appreciated, but it is not so generally known that other cells of the circulating medium can digest foreign particles.

Metchnikoff distinguished between the "motile" and "fixed" phagocytes, the former the leukocytes of the

3. Public Health Reports, 1917, **32**, 639.
4. Pituitary Extract and Milk Secretion, editorial, THE JOURNAL A. M. A., Dec. 26, 1914, p. 2292; Some Aspects of Lactation, Nov. 27, 1915, p. 1918.
5. Aschner: Ueber die Funktion der Hypophyse, Arch. f. d. ges. Physiol., 1912, **146**, 1.
6. Mathews, A. P.: Physiological Chemistry, 1915, p. 648.
7. Experimental Studies on the Relation of the Pituitary Body to Renal Function, Jour. Exper. Med., 1917, **25**, 153.
8. Motzfeldt, K.: Hypofyse og diurese, Norsk Mag. f. Lægevidensk. 1914, **75**, 1292.
9. Compare Zinsser, H.: Infection and Resistance, New York, 1914, from which some of the statements made above are taken.

blood, the latter certain connective tissue cells, endothelial cells, splenic pulp cells, and certain cellular elements of the lymph nodes, the neuroglia tissue, and, in fact, all phagocytic cells which are ordinarily confined to some definite localization in the body.[9] The latter groups are regarded as the ones concerned more particularly with the management of cellular detritus. It is thus evident that phagocytosis has been ascribed to a considerable variety of cells.

Zinsser has intimated that the identification of these structural elements in tissues is often a purely morphologic problem fraught with many possibilities of error. He ventures the assertion, nevertheless, that from a standpoint of phagocytic potency probably the most active fixed tissue cells are the endothelial cells of the blood vessels and those which line the serous cavities and the sinuses of the lymph nodes and the spleen. Among other varieties certain connective tissue cells are included.

Jones and Rous[10] of the Rockefeller Institute for Medical Research agree, likewise, that, in connective tissue, phagocytosis of bacteria and particles of unorganized matter occurs not infrequently. It can sometimes be seen about bacterial foci, and it is common in the neighborhood of old blood extravasations. They point out that such connective tissue as is ordinarily under observation is a congeries of cells of at least two sorts, namely, fibroblasts and endothelial cells from the blood and lymph channels. The latter are, of course, known to have phagocytic power.

Will the activity of such endothelial cells along with that of wandering cells account entirely for the phagocytosis observed in connective tissue? The new methods of Jones and Rous for obtaining individual, living cells from the fixed tissues by tryptic digestion has given an opportunity to make a direct test of the possible phagocytic power of the fibroblasts alone. The phagocytic ability of these suspensions of isolated cells against carmin and bacteria has been tested. The great majority of them, we are told,[10] fail to take up either, but a few large cells are able to do so. They will ingest bacteria only when serum is present; that is, they require the interaction of opsonins.

Jones and Rous[10] now state that there is good reason to suppose that these phagocytic cells are endothelial in nature. Should they prove to be fibroblasts, like the other elements present, the fact will remain that the phagocytic power of fibroblasts is practically negligible. Their failure to ingest foreign matter in vivo is to be laid not to the obstacles offered by the tissues they compose, but to an inherent lack of ability on their part. If these conclusions are valid, the phagocytosis of blood pigment, bacteria, etc., which takes place in granulation tissue is probably carried on wholly by endothelial cells and wandering cells.

10. Jones, F. S., and Rous, P.: The Phagocytic Power of Connective Tissue Cells, Jour. Exper. Med., 1917, **25**, 189.

Current Comment

HAVE YOU ACCEPTED YOUR COMMISSION?

In a letter from the Surgeon General's Office under date of May 17 it is stated that that office has recommended for commission in the Reserve Corps a total of 4,224 men, and that at the time of writing only 1,773 of those commissioned had sent their acceptances to the Adjutant General's Office, leaving 2,451 commissions at this time unaccepted. All these commissions had been out a sufficient length of time for the acceptances to be sent back. In some instances several months had intervened. It must be clearly understood that the receipt of a commission does not complete the enrolment of the medical officer. It is the duty of those men who have made application for commission in the Medical Reserve Corps to accept that commission, unless circumstances have developed in the interim between making application and receiving commission that warrant them in withdrawing their applications. In such cases, a letter to this effect should be sent to the Adjutant General, returning the commission and stating why. We appeal to those who have received commissions and who have not sent their acceptances to the Adjutant General's Office at Washington to do so at once. All that is asked is that the physician act at least in as respectful a manner toward his government as one business man acts toward another. Further, it should be realized that until one is fully enrolled the books, pamphlets, orders and various information that the government supplies to reserve officers will not be sent to him. Thus he will not be prepared when the call does come.

THE DUTY OF THE MEDICAL PROFESSION

In the National Guard, when its quota is full, there will be 433,800 men; in the new regular army there will be 293,000 men, and in the first draft of the new national army there will be 500,000 men. This makes an army of 1,226,800, whose mobilization is practically immediate. Such an army calls for 8,600 medical men as a minimum provision. This includes only the medical officers who will actually be with the army in the camps, and on active duty — not those who may go to Europe with hospital units or the 1,000 men asked for in France, or the large number of medical men that will be required for administrative work. This is possibly but the beginning. The 500,000 called for in the first draft of the new national army may be followed by a second call for 500,000, possibly for a third 500,000, and even it may be for a fourth 500,000, making an army of 2,000,000 men, as has been prophesied will be necessary. In such an event the medical department of the army will call for a total of 20,000 medical officers, which is nearly 15,000 more than have yet been commissioned. There are in the United States approximately 145,000 physicians; consequently less than one in seven is needed even for full preparedness. Is it possible that there shall finally be difficulty in obtaining voluntarily the medical men needed? We cannot believe so. It is inconceivable

that conscription of physicians will ever be necessary. But if we are to get the necessary 20,000 on the volunteer system there must be more eagerness for service shown on the part of our profession than has thus far been shown. THE JOURNAL this week carries a new blank[1] to nearly 70,000 medical men. May every man who receives it and who is within the age limit — under 55 — and physically and professionally qualified, recognize his debt to his country and his responsibility to his profession!

COLONEL GOODWIN AND THE MEDICAL OFFICER ON ACTIVE SERVICE

Colonel Goodwin of the British Commission to the United States has addressed organizations of medical officers in several of our cities, appealing to them for their aid and telling of conditions met on the West front early in the war. Colonel Goodwin took part in the retreat from Mons in August and September, 1914. His description of the action of a cavalry field ambulance in that significant engagement, a time when for ten days troops were continually moving, unable to rest, unable to remove their clothes — a time spent almost wholly in the saddle or on foot — is a narrative which by its simplicity, its statement of cold, inspiring facts, thrilled every audience which has had the enviable opportunity of hearing him. In his story there is one portion which is particularly noteworthy. He describes the days of activity, the terrible fatigue of men and officers, the utter inability to respond with renewed effort to new demands. Then came the time when at last the men were able to halt for rest. The officers did not at once, however, take advantage of this opportunity. The duties of the medical officer, says Colonel Goodwin, are first to take care of his wounded, second, to see that his horses are taken care of. This must be done at once. Otherwise the horses would be neglected "since the men are so dog-tired," as Colonel Goodwin expressed it. Third, the officer sees to it that his men are well fed and quartered. He must think of himself last. On the medical officer fall these responsibilities.

IMMEDIATE DUTIES OF MEDICAL RESERVE OFFICERS

Regularly commissioned Medical Reserve Officers, as well as those who are applying, or who are thinking of applying, for such commission are inquiring as to when they will be put on active duty and what that duty will be. Many letters are received in which the writers express the desire to be ready when the call comes, but do not want to make definite arrangements regarding their practice until they know how soon they may have to respond to the call of duty. It is impossible even for government officials to give the information positively as regards any particular individual. The following is a general statement that may be a basis from which each one may draw his own conclusions: It is probable that many Reserve Corps Officers — those of rather mature age — will be put on active duty to examine recruits. When the examination of these 500,000 recruits actually begins, it will put to the test the "preparedness" of the medical profession. To make a physical examination of 500,000, to give the series of prophylactic injections for typhoid fever and, in the majority of recruits, vaccinate against smallpox, will be an extensive and a serious undertaking. But it probably will be found that nearer 700,000 will have to be examined before the 500,000 "fit" men are secured. Hence we repeat again, the big, immediate work before those of our profession who have volunteered is that of examining recruits. Another point to be considered is this: As they pass their physical examination the recruits will be mobilized in camps to be located in various parts of the country. Some eighteen camps, it is stated, are being selected. To supply these camps will require 3,500 medical officers — that is, seven medical officers for each 1,000 men. These officers, since they have been drawn from civilian life, will have to meet conditions and problems and perform duties entirely different from those to which they have been accustomed — so different that special training and special instruction are positively necessary. Hence these 3,500 men must go through a course of training. Preliminary details for this training, we understand, are now being worked out. There will be three training camps for medical officers, Fort Oglethorpe, Fort Benjamin Harrison, and Fort Riley, each to accommodate 600 men. In addition, smaller groups of medical men will be assigned to, and take their training where reserve officers of the line are taking their special training. As a matter of fact, already quite a number of medical men have been assigned to training camps. Of course the Reserve Officers when trained will be transferred, part to the mobilization camps, and part to assist in the examination of recruits. The men assigned to these camps for training will probably be the younger men — those under 45.

1. For procedure see page 1558.

THE FOOD SUPPLY IN WAR TIME

The maintenance of the food supply of the army and of the civilian population of the country is as important a question as any which confronts our leaders in this time of rapid action and stirring events. In every foreign country food commissions were appointed early in the war to control this problem. A few weeks ago THE JOURNAL[1] emphasized the advisability of appointing at once in this country an appropriate scientific body to advise on these questions. In this issue appears the report of a meeting of the New York Academy of Medicine especially to consider this subject. The speakers, all of whom have been either eye-witnesses of conditions abroad or have specialized in food problems, were wholly agreed on several fundamental propositions. In brief, these were that our people must have a definite quantity of food suitable to their tastes as determined by their usual diet; second, that we must be prepared to supply our allies with all the food that can possibly

1. The Food Supply, editorial, THE JOURNAL A. M. A., April 28, 1917, p. 1262.

be spared after our own needs are satisfied; and third, that our enormous waste of food material must be controlled in some such manner as our allies and the enemy are controlling waste. To control these problems satisfactorily, the aid of scientific men who know what the physiologic needs of human beings are and what various conditions of life demand, must be consulted. In the appointment of a food board such men should have the first consideration. As Graham Lusk says: "The successful accomplishment of this task is the only factor that will save the world in the present situation."

"ABROGATE THE PATENT ON SALVARSAN"

Under this caption we publish this week — in the Correspondence Department — a communication from Drs. Finney and Walker of Baltimore. They present reasons for the abrogation of the patent on salvarsan additional to those given by the committee of the Chicago Medical Society and the St. Louis Medical Society, which were published five weeks ago.[1] Drs. Finney and Walker call for action on the part of medical men — medical societies especially. In a case of this kind appeals, to be effective, should be made to the individual Congressmen or Senators who represent the petitioners. But while resolutions count, individual action is needed also. Furthermore — and we would especially emphasize this — it is not the medical profession that is suffering; it is not the medical profession that has had to pay the enormous price for this product; it is the people. Consequently, appeal should be made to the people to aid in getting justice for themselves in this matter by the action of their own representatives.

URGENT NEED FOR YOUNG MEN FOR THE MEDICAL CORPS

Some weeks ago we called attention to the fact that when the full quota of the regular army, as enlarged by the act of June 3, 1916, was called there would be immediate and positive need for a large increase in the number of permanent medical officers. The call has now been made, and this enlarged regular army will soon be manned and equipped. As enlarged, it will consist of 293,000 men, and will need 2,051 medical officers. There are at the present time, all told, barely 550. The immediate need, therefore, is for 1,500 young medical men who are willing to make the army their chosen field by joining the Medical Corps. The life and professional work of the regular army medical officer has many attractions. It nowadays offers opportunities for the scientifically inclined that it did not offer until recent years. The position is one of honor, one that commands respect, and one that presents many opportunities for the ambitious. Considering the number of men available for the position, there should be no difficulty in securing the needed 1,500. Basing the statement on the number of physicians who have graduated during the last six years, there are at least 20,000 who are eligible, so far as age and professional standing are concerned. The age limit until Jan. 1, 1918, is 34 years; after that, 32 years. It cannot be emphasized too strongly that the needs are urgent, and that those who are considering making application for membership in the Medical Corps should do so at once.

1. THE JOURNAL, April 21, 1917, p. 1203, "Abolition of Patents on Salvarsan."

Medical Mobilization and the War

Information Regarding Appointment in the Medical Reserve Corps of the U. S. Army

THE JOURNAL this week publishes again a personal application blank for the Medical Reserve Corps. The following facts should be borne in mind:

QUALIFICATIONS.—The applicant must be a citizen of the United States, between 22 and 55 years of age; a graduate of a reputable medical school; must have qualified to practice medicine in some state, and must be in the active practice of his profession. "Active practice" includes those who specialize in eye, ear, nose and throat, dermatology, neurology, obstetrics, etc.

PROCEDURE.—Note carefully the following procedure: 1. Fill out the personal application blank; read carefully every question before answering it, and write distinctly. 2. After filling out the blank subscribe and swear to it before a notary public or other person authorized to administer oaths. This is very essential; the form is not complete without this procedure. 3. Obtain letters of recommendation from at least two citizens who know you. It would be well if at least one of these were a physician. Then attach these letters to your application blank. Keep copies for your own information and future satisfaction. 4. Communicate with the examining board most convenient to you—a list of boards up to May 17 is printed below—and arrange for an examination. You can send your application blank and letters or take them with you when you appear before the board. When you report to the board for examination, if you have not already done so, present your application blank, your testimonials, your state certificate and if of foreign birth, documentary evidence of your full citizenship.

EXAMINATION.—The professional examination for the Reserve Corps is not severe, is oral and practical in character.

MEDICAL CORPS.—It must be remembered that there is an urgent demand for members of the Medical Corps. We shall be glad to send application blanks to those who wish to apply for membership in this corps. A physician may be commissioned in the Medical Corps of the Army provided he is between 22 and 32 years of age (34 up to Jan. 1, 1918), a citizen of the United States and a graduate of a reputable medical college. He must have had also at least one year's hospital training subsequent to graduation, including practical experience in the practice of medicine, surgery and obstetrics and will be expected to present evidence to that effect. Whether or not he is married has no effect on his eligibility to the Medical Corps. He must pass a preliminary examination and a final or qualifying examination in accordance with the rules and regulations which may be obtained on application.

War Registration and the New York Session

Under the Selective Conscription Act every male civilian physician between 21 and 30 years of age, inclusive, must register at the place of his permanent residence. This registration must be effected on Tuesday, June 5. This date is the second day of the New York Session of the American Medical Association. Registration for the draft cannot be effected at any other place than the residence of the man registering or at any other time. The regulations, how-

ever, permit a prospective registrant to perform that part of the registration process that is essentially personal in advance of the registration day if he is to be absent from his home on that day. According to information received from the office of the Provost Marshal General, a physician who will be absent from his permanent place of residence on registration day may apply to the county clerk, or to the city clerk if he lives in a community where registration is to be effected on the basis of the city, as a unit, for a registration card. The clerk will prepare a card and deliver it to the applicant. The applicant must then deliver the card filled out or see that by mail or by responsible messenger it is delivered to the chief registrar of the registration precinct in which the applicant would normally register so as to be in his hands not later than June 5. He should leave or send with it a self-addressed stamped envelope so that on registration day the chief registrar can mail him a registration certificate as evidence that the requirements of the law have been complied with. Every physician who is within the class required to register and whose attendance at the New York meeting will compel him to be absent from his permanent place of residence on Tuesday, June 5, should without fail attend to all preliminaries of registration before leaving home.

Physicians to Assist in Registration for Military Service

The President has prescribed certain registration regulations for the registration of June 5.

Registration is to be made primarily on the basis of the county as a unit. In each county or similar subdivision it is to be entrusted to a board of registration, consisting of at least three members, named by the governor. Normally each such board is to consist of the sheriff, the county clerk, and the county physician. If there is no medical officer in the county or other similar registration subdivision, or where the medical or health officer of any such subdivision is not a licensed physician, or where the governor deems it inadvisable to constitute a local medical officer surgeon of the board, the governor may name a licensed physician to act in that capacity. But no member of a registration board may be connected with the military establishment.

Cities of 30,000 population and over are not to be within the jurisdiction of the county board but are to be under the jurisdiction of the mayor or the officer or officers corresponding to the mayor, and such cities may be divided into registration districts of approximately 30,000 population each if it is deemed advisable to do so, a separate registration board being appointed by the mayor, for each such district. A licensed physician is to be appointed on each board.

If a member of a registration board does not volunteer his services without compensation, he will be paid $7.50 as a lump sum for his work, but volunteer service as a matter of patriotism will be welcomed. This compensation will be entirely separate from compensation rendered in connection with the further execution of the law, such as those that will be incident to the making of the selective draft. It is now intended to convert registration boards into boards for the making of the draft, but regulations governing compensation for such services have not yet been formulated.

Medical Reserve Corps Officers Assigned to Active Duty

The following officers of the Medical Reserve Corps have been assigned to active duty at the designated mobilization camps: Capt. Clarence B. Ingraham, Jr., of Denver, Golden, Colo.; First Lieut. Albert W. Lindberg of Hillsboro, Springfield, Ill.; Capt. Hans Hansen of Logan, Fort Des Moines, Iowa; First Lieut. Edward S. Parker of Ida Grove, Camp Dodge, Iowa; Capt. Herbert Atkins of Pratt, Fort Riley, Kan.; First Lieut. Constant M. Colignon of Muskegon, Camp Grayling, Mich.; First Lieut. Harry B. Zimmerman of St. Paul, Fort Snelling, Minn.; First Lieut. Robert R. Glynn of Springfield, Nevada, Mo.; First Lieut. Joseph M. Shramek, Omaha, Fort Crook, Neb.; First Lieut. Hugo Mella of Bismarck, Fort Lincoln, N. Dak.; First Lieut. Benjamin I. Harrison of Cleveland, Camp Perry, Ohio; First Lieut. Lee W. Cary of Winnebago, Camp Douglas, Wis.

First Lieutenants Henry G. Turner of Raleigh, N. C., Thomas M. Chaney of Winston-Salem, N. C., Nuckols T. Davie of West Blockton, Ala., Charles T. Grier of Carthage, N. C., and Charles W. Armstrong of Troy, N. C., have been assigned to active duty and ordered to report in person to the commanding officer at Fort McPherson, Ga. Capt. Frederick T. Harris of Lewiston, Idaho, has also been assigned to active duty and has been ordered to report by telegraph to the commanding general of the Western Department.

See That Your Patients Register

On June 5 every male person in the United States between the ages of 21 and 30 years, both inclusive, who is not an officer or enlisted man in the Regular Army, the Navy, the National Guard, or the Naval Militia, in the service of the United States, must be registered. Ordinarily a person who is to be registered must present himself in person at the registration booth for that purpose. Any one who on account of sickness is unable to do so may cause some suitable person to apply to the county or the city clerk for a copy of the registration card and for authority to fill it out. If satisfied that the case is bona fide, the clerk will deputize the person applying for the card to make the proper entries on it and to fill out the registrar's report that the card calls for. The card is then to be mailed by the sick person, or delivered by his agent, to the registrar in the sick person's voting precinct in time to reach there by the day set for registration—June 5. The sick person should enclose with his registration card, if he mails it, a self-addressed stamped envelope, in order to enable the registrar to send him the registration certificate, as evidence of having registered. Physicians should bring this matter to the attention of their patients, and cooperate with them in obtaining registration.

Offering Service With Provisos

A recent letter from the office of the surgeon-general of the army says that a large number of medical men are offering their services "in case of emergency" and for "their specialty only." It should be made plain that the emergency has already arrived and that the department is in urgent need of every qualified medical officer it can obtain and that men who accept commissions in the Medical Reserve Corps must be ready for active duty of such character as the exigencies of the service may demand; that there will be for all of them a great deal to learn in addition to professional knowledge which they now have, whether they are specialists or general practitioners. It should be quite as easy for the specialist to learn his other duties as a medical officer as it will be for the large number of men throughout the country who are accepting line commission without any knowledge at all of the military service. "If you can, through the columns of THE JOURNAL," says the letter, "explain this matter to the profession at large, it will save this office a very great deal of unnecessary correspondence and may avoid dissatisfaction among those who are tendering only qualified services."

Protecting the Practice of the Absent Physician

THE JOURNAL has received the following inquiry from a Virginia physician:

"Will you please send me the outlines of one or more plans that have been adopted or suggested for looking after the practice of those in this city who may enlist in the Medical Reserve Corps? I have the honor of being chairman of a local committee to suggest such a plan to the local society and would like to know what others have done."

ANSWER.—The following is a list of references on this subject which have appeared in THE JOURNAL:

Punishing Patriotism. April 14, 1917, p. 1131.
Offers Services to Soldiers' Families. April 21, 1917, p. 1190.
Resolutions by the Chicago Laryngological and Otological Society. April 28, 1917, p. 1269.
Will Conserve Practices of Medical Officers. April 28, 1917, p. 1270.
How They Protect the Absent Physician in England. April 28, 1917, p. 1270.
Military Surgeons' Practice to be Protected. May 5, 1917, p. 1331.
The Responsibility of the County Society in Preparedness. May 19, 1917, p. 1484.
Conservation of Medical Practice During the War. May 19, 1917, p. 1487.
Practice of Physicians in Military Service. May 19, 1917, p. 1487.

Medical Students Must Register

To the Editor: On page 1415 of the edition of THE JOURNAL of May 12, under the heading "Medical Students and Conscription," you state that there will be an exemption of medical students from the selective draft. I have a copy of the Emergency Army Bill from the *Army and Navy Journal*, and under exemptions I find no such mention. What am I to infer from this, and what definite enlightenment can I get

on this subject? This is a very important question to me and I should like to have you look into it at your convenience, before registration day if possible, and advise me. I would be very grateful to THE JOURNAL for this information.

ANSWER.—The above letter is from a physician in Minnesota. The question has already been answered in THE JOURNAL. No exemption is made in the law for medical students or for prospective medical students. Incidentally, neither is any exemption made for civilian physicians under 31 years of age. There is no doubt, however, that medical students will be exempted by regulation immediately after registration is completed. However, it must be borne in mind that this exemption will take place after registration; in other words, medical students must register.

Examinations for the Medical Corps of the Navy

Examinations of candidates for commissions in the regular Medical Corps of the Navy will be held on June 2, at fourteen naval stations in various parts of the United States. Approximately 350 candidates have already presented satisfactory credentials and will be admitted to examination.

The Bureau of Medicine and Surgery of the Navy Department is in receipt of information in advance of the formal official reports, from some of the examining boards that conducted the examinations of May 11. Of the fourteen candidates examined at Washington, D. C., eleven passed; of thirty-one examined at the Great Lakes Station, near Chicago, twenty-four passed; of four examined at Charleston, S. C., two passed, and the one candidate examined at Pensacola, Fla., passed. Other examining boards remain to be heard from.

Naval Medical School Begins with a New Class

Sixty-six candidates for commissions in the regular Medical Corps of the Navy began a course of study at the Naval Medical School at Washington, D. C., May 15, to prepare them for their duties. They will be required, however, to take the regular examination to be held on June 2, to which all candidates for commissions are to be subjected. In the selection of questions and tests to be used in the examination care will be taken to exclude any concerning which a candidate might have at the time of the examination acquired any special knowledge while at the Naval Medical School, so as to put the candidates who have begun training at the school on exactly the same plane as the candidates who have not had the advantage of such training.

Bureau of Information of Casualties

The American Red Cross has just established a bureau of information of casualties, under the direction of Prof. William E. Castle of Harvard University. This bureau will relieve the medical and the fighting forces of the burden of correspondence concerning the sick, wounded, killed, missing and prisoners, gathering such information as may be obtainable and transmitting in a sympathetic and humane way to the home folks such as can properly be sent, and forwarding to the adjutant-general such as may be of value to him.

Training Camps for Medical Reserve Corps

Army training camps for medical officers in the Reserve Corps have been established at Fort Oglethorpe, Ga., near Chattanooga, Tenn.; at Fort Riley, Junction City, Kan., and at Fort Benjamin Harrison, Indianapolis. Each camp will accommodate 600 officers under instruction. Medical officers in the Reserve Corps who are under 45 years of age are to be ordered to these camps for a period of three months' practical training, preparatory to active service.

Base Hospitals Reach Port

Lakeside Base Hospital No. 4, Cleveland, under the command of Major H. L. Gilchrist, with Dr. George W. Crile, director, reached a European port on May 18. The Harvard Medical School Unit, Red Cross Base Hospital No. 5, under the command of Major R. W. Patterson, with Dr. Harvey Cushing as director, reached Falmouth, England, on May 22.

Examining Boards for Medical Reserve Corps

The following is a list of medical boards as appointed up to May 21. The name and address of the chairman of the board only is given. It is presumed that applicants will select the board most accessible to themselves even though this may mean a board in another state:

ALABAMA

BIRMINGHAM—Capt. John M. Lowrey, M. R. C., 727 1st National Bank Bldg.
MOBILE—Capt. John O. Rush, M. R. C., 412 Van Antwerp Bldg. (also O'Gynn and Kilpatrick).
MONTGOMERY—Major J. N. Barker, M. R. C.

ARIZONA

DOUGLAS—The Surgeon, U. S. Troops.
FT. HUACHUCA—The Surgeon.
NACO—The Surgeon, U. S. Troops.

ARKANSAS

HOT SPRINGS—Commanding Officer, Army and Navy General Hospital.

CALIFORNIA

CORONADO—Major William L. Kneedler, U. S. A., Retired.
LOS ANGELES—Capt. John J. Kyle, M. R. C., 702 Title Insurance Bldg.
SAN FRANCISCO—Commanding Officer, Letterman Gen. Hosp., Presidio, San Francisco.

COLORADO

DENVER—Capt. Cuthbert Powell, M. R. C., Metropolitan Bldg., President.
FT. LOGAN—The Surgeon.
TRINIDAD—Lieut. John R. Espey, M. R. C., Main and Walnut Sts.

CONNECTICUT

NEW HAVEN—Lieut. John W. Churchman, M. R. C.

DISTRICT OF COLUMBIA

WASHINGTON—Commandant, Army Medical School.
WASHINGTON—Major Abram B. Hooe, M. R. C., 1220 Sixteenth St., N. W., President (local only).
WASHINGTON—Major W. D. Webb, M. C., 1803 Connecticut Ave., N. W. (Univ. of Va.). Visits University of Va., Charlottesville, every Thursday.

FLORIDA

FT. BARRANCAS—The Surgeon.
JACKSONVILLE—Capt. Graham E. Henson, M. R. C., St. James Bldg.
KEY WEST BARRACKS—The Surgeon.
TAMPA—Lieut. E. H. McRae, M. R. C., American Bank Bldg.

GEORGIA

AUGUSTA—Major Eugene E. Murphy, M. R. C., 432 Telfair St.
FT. MCPHERSON—The Surgeon.
FT. OGLETHORPE—The Surgeon.
FT. SCREVEN—The Surgeon.

IDAHO

BOISE—Lieut. Col. Marshall W. Wood, U. S. A., Retired.

ILLINOIS

CHICAGO—Major John A. Hornsby, M. R. C., 111 W. Washington St., President.
MT. VERNON—Capt. William H. Gilmore, M. R. C.
SPRINGFIELD—Capt. George N. Kreider, M. R. C., 522 Capitol Ave.

INDIANA

FT. BENJAMIN HARRISON—The Surgeon.
INDIANAPOLIS—Major George M. Wells, Retired, M. C., 622 Hume-Mansur Bldg., President.

IOWA

FT. DES MOINES—The Surgeon.

KANSAS

EAST HUTCHINSON—Lieut. Herbert L. Scales, 506 Avenue A.
FT. RILEY—The Surgeon.
LEAVENWORTH—Lieut. James R. Langworthy, M. R. C., Ryan Bldg.

KENTUCKY

ASHLAND—Lieut. John W. Stephenson, M. R. C.
EOWLING GREEN—Major Arthur T. McCormick, M. R. C.
LOUISVILLE—Capt. Frank T. Fort, M. R. C., "The Atherton."

LOUISIANA

BATON ROUGE—Capt. Charles McVea, M. R. C.
JACKSON BARRACKS—The Surgeon.
NEW ORLEANS—Major Isadore Dyer, M. R. C., 124 Baronne St., President.

MAINE

BRUNSWICK—Lieut. F. N. Whittier, M. R. C., Bowdoin College.
PORTLAND—Dr. William L. Cousins, 231 Woodford St.

MARYLAND

BALTIMORE—Capt. John S. Davis, M. R. C., 1200 Cathedral St.

MASSACHUSETTS

BOSTON—Major Horace D. Arnold, M. R. C., Harvard Univ. Graduate School of Medicine (President).
FT. BANKS—The Surgeon.
SPRINGFIELD—Lieut. Charles F. Lynch, M. R. C., 387 Main St.

MICHIGAN

ALBION—Lieut. George C. Hafford, M. R. C.
ANN ARBOR—Lieut. Reuben Peterson, M. R. C., Univ. of Michigan Med. School, President.
BATTLE CREEK—Capt. W. H. Haughey, M. R. C.
DETROIT—Major Angus McLean, M. R. C., David Whitney Bldg.
MARQUETTE—Lieut. A. W. Hornbogen, M. R. C.
SAULT STE. MARIE—Lieut. E. H. Webster, M. R. C.

MINNESOTA

FT. SNELLING—The Surgeon.
MINNEAPOLIS—Lieut. James F. Corbett, M. R. C., 4401 E. Lake Harriett Blvd., President.
ROCHESTER—Major Charles W. Mayo, Mayo Clinic.
WINONA—Lieut. Hugh McGaughey.

MISSISSIPPI

HATTIESBURG—Capt. W. W. Crawford, M. R. C.
MERIDIAN—Lieut. I. W. Cooper, M. R. C.
VICKSBURG—Capt. J. S. Ewing, M. R. C.
WINONA—Major J. W. Barksdale, M. R. C.

MISSOURI

COLUMBIA—Dr. Mazyck H. Ravenel, University of Missouri.
DONIPHAN—Dr. John R. Hume.
FT. WILLIAMS—The Surgeon.
JEFFERSON BARRACKS—The Surgeon.
KANSAS CITY—Major J. F. Binnie, M. R. C., Rialto Building.
SPRINGFIELD—Capt. Joseph W. Love, M. R. C.
ST. CHARLES—Dr. Frank J. Tainter.
ST. JOSEPH—Dr. Daniel Morton.
ST. LOUIS—Capt. William H. Luedde, M. R. C., 311 Metropolitan Bldg., President.
TRENTON—Dr. James R. McVay.

MONTANA

FT. MISSOULA—The Surgeon.
HELENA—Major William C. Riddell, M. R. C., 504 Dearborn Ave.

NEBRASKA

LINCOLN—Capt. L. B. Sturdevant, M. R. C., 2757 Holdredge St.
OMAHA—Col. John M. Banister, U. S. A., Ret., 400 Brandeis Theater Bldg.

NEVADA

RENO—Lieut. Raymond St. Clair, M. R. C., Nixon Bldg.

NEW JERSEY

ATLANTIC CITY—Dr. Curney Williams, 3915 Atlantic Ave.
NEWARK—Capt. David A. Kraker, M. R. C., 236 Broad St.

NEW MEXICO

FT. BAYARD—The Commanding Officer.

NEW YORK

ALBANY—Major Henry L. M. Shaw, M. R. C., 361 State St., President.
BUFFALO—Capt. Herbert A. Smith, M. R. C., 566 Delaware Ave.
PLATTSBURG—The Surgeon.
NEW YORK—Major Henry C. Coe, M. R. C., Academy of Medicine, 17 W. 43d St., President. Office Hours—3 to 5 p. m. every day except Saturday and Sunday.
NEW YORK—Dr. Simon Flexner, 150 E. 61st St.
ROCHESTER—Major John M. Swan, M. R. C., 457 Park Ave.
SYRACUSE—Major James I. Mabee, M. C., 309 Orange St.

NORTH CAROLINA

FT. CASWELL—The Surgeon.
GREENSBORO—Major John W. Long, M. R. C., 119 Church St.

NORTH DAKOTA

BISMARCK—Lieut. Albert M. Fisher, M. R. C.

OHIO

CINCINNATI—Major Robert D. Maddox, M. R. C., 4 West 7th St., President.
CLEVELAND—Capt. Harry G. Sloan, M. R. C., 1021 Prospect Ave., S. E.
COLUMBUS BARRACKS—The Surgeon.

OKLAHOMA

FT. SILL—The Surgeon.
OKLAHOMA CITY—Lieut. Rex G. Boland, M. R. C., 1524 West 29th St.

PENNSYLVANIA

HARRISBURG—Capt. Benjamin F. Royer, M. R. C., Donaldson Apts.
PHILADELPHIA—Lieut. Col. Henry Page, M. C., Aldine Hotel (special only).
PHILADELPHIA—Major Elijah H. Siter, M. R. C., 1818 S. Rittenhouse Square, President.
PITTSBURGH—Major John W. Boyce, M. R. C., Empire Bldg., President.
SCRANTON—Lieut. J. Mayhew Wainwright, 516 Spruce St.

RHODE ISLAND

NEWPORT—Lieut. Charles D. Easton, M. R. C., 36 Ayrault St.
PAWTUCKET—Capt. James L. Wheaton, 210 Main St.
PROVIDENCE—Major John W. Keefe, 262 Blackstone Bldg.

SOUTH CAROLINA

CHARLESTON—Col. A. N. Stark, M. C.
COLUMBIA—Lieut. Francis A. Coward, M. R. C., State Board of Health Laboratory.
FT. MOULTRIE—The Surgeon.

SOUTH DAKOTA

ABERDEEN—Lieut. William E. Clark, 519 Seventh Ave., S. E.
STURGIS—Capt. J. D. Brooks, M. R. C.

TENNESSEE

MEMPHIS—Major Frank D. Smythe, M. R. C., 534 East St.
NASHVILLE—Major Lucius E. Burch, Eve Building.

TEXAS

AUSTIN—Capt. Albert F. Beverly, 311 W. 13th St.
DALLAS—Capt. Edgar W. Loomis, M. R. C., 236 Page Ave.
FT. BLISS—Commanding Officer, Base Hospital.
FT. CROCKETT—The Surgeon.
FT. SAM HOUSTON—Commanding Officer, Base Hospital.

UTAH

FT. DOUGLAS—The Surgeon.

VERMONT

FT. ETHAN ALLEN—The Surgeon.

VIRGINIA

FT. MONROE—The Surgeon.
NORFOLK—Lieut. Burnley Lankford, M. R. C., 530 Shirley Ave.
RICHMOND—Major Stuart McGuire, M. R. C., 512 Grace St., East, President.
STAUNTON—Capt. Wilbur M. Phelps, M. R. C.

WASHINGTON

FT. GEORGE WRIGHT—The Surgeon.
SEATTLE—Capt. Ira A. Brown, M. R. C., 901 Seventh Ave.
VANCOUVER BARRACKS—The Surgeon.

WEST VIRGINIA

CHARLESTON—Major John E. Cannaday, M. R. C., Capital City Bank.
WHEELING—Lieut. William H. McClain, M. R. C., 83 Twelfth St.

WISCONSIN

MILWAUKEE—Capt. C. V. I. Brown, M. R. C., 349 Prospect Ave., President.
SHEBOYGAN—Major E. J. Barrett, M. R. C.

ALASKA

FT. GIBBON—The Surgeon.

PORTO RICO

SAN JUAN—Col. Basil H. Dutcher, M. R.

Mobilization of Medical Reserve Corps

For the week ending May 19, 1917, 399 physicians were recommended for commissions in the Medical Reserve Corps. Of these, 15 were recommended for appointment as majors, 37 as captains and 347 as first lieutenants.

New Base Hospital.—The people of Buffalo have pledged a fund of $75,000 to provide a base hospital and the medical men of the city have pledged themselves to furnish $10,000 of this amount.

Pharmaceutical Corps Desired.—The Philadelphia Drug Exchange has initiated a movement for the establishment of a pharmaceutical corps in the United States Army, and has addressed a letter to the secretary of war asking for its establishment. It is pointed out that the enlisting of pharmacists in the line is unjust to these men who have had professional training. It is also pointed out that these men might make valuable medical assistants in case of a shortage of physicians.

The Russian-Roumanian Medicosurgical Society.—A French medical unit is with the Russians and Roumanians in the Jassy region, and a medical society has been organized among the physicians there. At its first meeting, recently, Dehelly described the Carrel method of treating wounds. The society has three presidents, the Russian, d'Osten Sacken; Coulland, chief of the French unit, and the Roumanian bacteriologist, Cantacuzene. All the Roumanian physicians and most of the Russians speak French, so the *Bulletin* will be published in French. J. Clunet was in charge of the French unit at first but succumbed recently to typhus.

To Study Social and Economic Problems.—In anticipation of the social and economic problems likely to result from the German-American War, the National Council of Defense, through its Advisory Commission on Labor and Welfare—Mr. Samuel Gompers, chairman—has appointed Mr. Frederick L. Hoffman, statistician of the Prudential Insurance Company of America, chairman of the National Committee on Statistics and Information. The plan is to inaugurate at once a national statistical service whereby the state of the nation regarding health, physical and social wellbeing, sickness and accidents in industry, unemployment, etc., may be presented with scientific conclusiveness from week to week, for the information of the council and the public at large.

Nurses of Northwestern Unit Killed.—Two nurses connected with base hospital No. 12, known as the Northwestern

Base Hospital Unit, which was on its way to France, were killed by an accident, May 20. The *Mongolia*, on which the unit sailed, was about 100 miles east of New York, and in accordance with the usual practice the guns were fired to test mounts and ammunition and to drill the navy gun crew on board. One of the charges exploded and splinters of the brass case ricocheted and were deflected to the deck of the ship, where several nurses were watching the firing. Mrs. Edith Ayres and Miss Helen Burnett Wood were killed and Miss Emma Matzen was seriously wounded. The *Mongolia* returned to New York so that an official investigation of the occurrence might be made.

Modern Hospital Train Presented.—In presenting to Maryland the most modern hospital train to be found in this country or abroad, the three railroads making the gift, the Baltimore and Ohio, the Pennsylvania and the Western Maryland, have enabled Maryland to be first in this field. The credit for the idea is due to Dr. Daniel Z. Dunott, chief surgeon of the Western Maryland Railway. There are six cars which make up the train. Three of these are hospital cars, with forty-two hospital beds; an operating car, which it is claimed is not surpassed in the completeness of its equipment by any operating room in the city; a Pullman and dining car for the personnel of the hospital, and an express car which carries two motor ambulances. An overhead trolley by means of which a stretcher may be carried from one car to another is a special feature.

Only Commissioned Medical Officers Will Be Called On.—Please answer through THE JOURNAL the following questions:

1. Will the government exhaust the Medical Reserve Corps before it calls on medical men outside of the reserve?
2. Would a man of 50 in the reserve corps be taken before one of 40 or under not in the reserve corps?

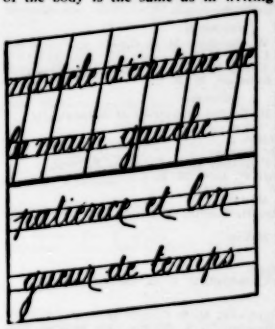
C. O. HENRY, Fairmont, W. Va.

ANSWER.—Yes, to both questions.

Devices Used in Combating Gases in Trench Warfare.—Dr Yandell Henderson, professor of physiology in the Yale Medical School, and J. W. Paul, in charge of the rescue work of the Bureau of Mines, the experts of this bureau, state that the present types of oxygen-rescue apparatus are imperfect and involve grave danger. One instance given in the exhaustive report which the bureau has made on this subject is that the apparatus is so constructed that the oxygen supply can be set at a rate sufficient only for moderate exertion on the part of the wearer; hence rapid movement when wearing this mask might mean suffocation at a time when leisurely movement would result in the death of the wearer. W. E. Gibbs, an experienced engineer, has produced a new apparatus in accordance with the physiologic lines recommended by this report which experimental tests have shown to be far superior to the older types, and which he hopes to so modify as to be serviceable in the European trench warfare.

Ambulance Items.—There is said to be at present 500 American ambulances on duty on the French fighting fronts.——The board of directors of the Chicago College Club has voted to raise a fund for the purchase of a Red Cross ambulance in the name of the college women of Chicago.——Dr. Stephen V. Balderston, Evanston, who is connected with the Northwestern University Ambulance Company, has received orders for the enlistment of the organization.——St. Mary's Notre Dame College Club has arranged to provide an ambulance, to be known as St. Mary's ambulance, for service in France.——At a reception held in New York, May 11, for University of California students who are on their way to France, $45,000 was subscribed for the American Field Ambulance Service.——An ambulance company for service in France is being recruited by the Chicago chapter of the Red Cross.——Dr. George Dock, St. Louis, has received the French war cross and has been mentioned for his service in moving wounded soldiers under heavy bombardment while engaged in the American Field Ambulance Service.——Members of the Evanston (Ill.) Club have subscribed $15,000 for the fund to provide an ambulance for service in France.——Employees of the American Radiator Company, of America, have donated a fully equipped ambulance in memory of Frederick W. Monahan, one of the founders of the American Ambulance Corps in France.——Three ambulances have been presented to the Detroit College of Medicine and Surgery, Base Hospital Unit No. 36.——Brooklyn students of University and Bellevue Hospital Medical College are securing subscriptions in Brooklyn for the purchase and equipment of ten ambulances to be sent with the first American contingent to France.

Training the Left Hand in Writing.—Dr. C. W. Hutt has described in the *Lancet* (April 7, 1917, p. 553) the work of M. Tamenne, a Belgian refugee, at the Professional School for the Wounded at Montpellier, in teaching maimed soldiers to write with the left hand. Tamenne, who is a one-armed man, places considerable emphasis on learning to write in a hand resembling as closely as possible the former handwriting, which, he says, contributes in a large degree to make the maimed person think of himself as not handicapped in any way. The writing taught has the same slope as ordinary writing; not even upright writing is allowed. The position of the body is the same as in writing with the right hand.



The following rules are given: 1. Place the forearm comfortably on the table so as to fatigue the hand as little as possible. 2. Practice writing between lines about 3.5 mm. apart. 3. Place the paper in a sloping position as shown in the accompanying illustration. 4. Try from the beginning to give the letters the usual slope. This may be facilitated by drawing faint oblique lines as shown in the illustration and making the up and down strokes of the letters parallel with these oblique lines. 5. Always be sure that the hand is immediately below the point of writing. The last two rules will be found difficult and will tire the hand. Rest should be taken for a few minutes and the practice then resumed. After nine or ten lessons of an hour and a half it is said the difficulty will be overcome and the letters will be formed easily and the movements become more precise. After acquiring some skill the writing should be done between lines 2.5 mm. apart, and later on a single line. Do not try to rush the matter by practicing too long at a time, or by making the letters carelessly. Time will be lost in this way. Considerable skill should be acquired in two months.

Care of Physicians' Practice.—At the meeting of the Kings County New York Medical Society in Brooklyn, May 15, resolutions were adopted favoring the dividing of fees for the benefit of physicians who are called to the colors. It is proposed that the physician attending the case shall receive 50 per cent. and the remainder of the fee shall be turned over to the family or dependents of the physician at the front.——The Lyon-Lincoln Counties (Minnesota) Medical Society, at a recent meeting, adopted resolutions that dependent members of famillies of all who enlist (but not conscripts) and who hold rank below that of lieutenant, will be attended by members of the society when necessary free of charge, and that they would attend patients of physicians who enlist and on their return would give over to them the fees collected on the accounts held against their patients, and will furthermore endeavor to return such practice to the physician intact.——The Michigan State Medical Society, at its annual meeting, voted unanimously to take care of all dependents of physicians who go to the front and to conserve their practice.——Sixty members of the Rogers Park (Ill.) Physicians' Club, May 13, volunteered to take care of the practice of all physicians in Rogers Park who enter military service and to turn over 50 per cent. of the fees received to the family of the physician.——At a meeting of St. Louis physicians, May 12, an agreement was made whereby physicians of St. Louis who are exempt from military service will take over the practice of physicians at the front and divide fees with them.——The Physicians' Club of Oak Park has passed resolutions to care for the patients of all physicians called to the colors, and to give 50 per cent. of all fees received from such patients to the families of the absent physician, and to return these patients to the physician on his return from military service.——The Washington County (R. I.) Medical Society has adopted a resolution that should any member of the society leave his practice for war service the members of the society remaining at home will carry on his practice and pay his family 50 per cent. of the proceeds.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

DISTRICT OF COLUMBIA

Ambulance Company Organized at Washington, D. C.—The Washington Ambulance Company, with Dr. Ryan Devereux, Medical Department, U. S. Army, as captain, will go into training at Allentown, Pa., May 24. Equipment is being provided by public subscription. One hundred and fifteen persons have pledged themselves to service in this corps, and sixty-three have already been sworn in. Members of the corps are looking forward to service in France as soon as the company has had the necessary training.

GEORGIA

New Hospital for Fort McPherson.—Congress has appropriated $90,000 for the erection of a new hospital at Fort McPherson, near Atlanta.

Personal.—Dr. and Mrs. Elijah S. Peacock, Harrison, celebrated the twenty-fifth anniversary of their wedding, April 18.——Dr. William H. Goodrich has been elected chairman of the Board of Control of the University Hospital, Augusta.

Salvarsan Resolutions.—At a recent meeting of the Georgia Medical Society of Chatham County, Savannah, resolutions were adopted setting forth the vital importance of salvarsan, the uncertainty and difficulty of obtaining the drug on account of its being protected by patent rights and the fact of its manufacture abroad, and urging Congress to abolish the patents on this drug and its closely related products.

ILLINOIS

Chicago

Results of Cook County Intern Examinations.—The results of the competitive examinations for internship in the Cook County Hospital recently announced place 68 men on the eligible list. Of this number, 41 are graduates of Rush Medical College, 13 graduates of the University of Illinois College of Medicine and Surgery, 9 graduates of Northwestern University and 5 of the Chicago College of Medicine and Surgery.

The Retreat from Mons.—Col. Thomas H. J. C. Goodwin, R. A. M. C., C. M. G., D. S. O., the medical member of the British Commission, visited Chicago, May 22; was entertained at luncheon at the Union League Club, and in the afternoon attended the initial meeting of the State Committee for National Defense, and there detailed the needs of the Allies for surgeons and nurses, and expressed his appreciation of the prompt response to this appeal. He was the guest of honor of the Medical Reserve Corps, U. S. Army, Illinois Division, at a dinner at the La Salle in the evening, and after dinner gave a very simple and plain, but effective and thrilling account of his personal experiences as officer in command of a field ambulance during the advance of the Germans toward Paris, which necessitated the retirement of the British troops for a time. He paid an eloquent tribute to the loyalty, self-sacrifice and devotion of the officers and men of the sanitary troops, hundreds of whom had laid down their lives in the endeavor to evacuate the wounded from the front and to alleviate their sufferings. At the conclusion of Colonel Goodwin's address, an informal reception was held.

IOWA

Hospital News.—A site has been purchased for the Tuberculosis Sanitarium for Dubuque County. The tract of land is 26 acres in extent, located between Fifth and Seventh avenues, and near Eagle Point.——The Sisters of St. Francis have purchased the Le Mars Hospital and will rebuild it at a cost of $85,000.

Personal.—Dr. John C. Murphy, Davenport, has been commissioned lieutenant, M. C., Iowa N. G., and assigned to duty with the Field Artillery.——Dr. Frank T. Launder, Garwin, has been elected a member of the state board of health, succeeding Dr. Henry A. Dittmer, Manchester, term expired.——Dr. Frank O. Burk, Davenport, has succeeded Dr. Emil A. Ficke as physician of Scott County.——Dr. Charles R. Jones, Atlantic, is reported to be seriously ill with duodenal ulcer.

State Medical Women Elect.—The State Society of Iowa Medical Women held its twentieth annual meeting at Des Moines, April 8, under the presidency of Dr. Lily Kinnier, Dubuque, and the following officers were elected: president, Dr. Laura House Branson, Iowa City; vice presidents, Drs. Jeannette F. Throckmorton, Chariton; Josephine M. W. Rust, Grinnell, and Rosabell A. Butterfield, Indianola; secretary, Dr. Ida G. Rhoades, Cedar Falls (reelected), and treasurer, Dr. Nelle Noble, Des Moines.

New State Officers.—The sixty-sixth annual meeting of the Iowa State Medical Society was held at Des Moines, May 9-11, under the presidency of Dr. John F. Herrick, Ottumwa. Fort Dodge was selected as the place of meeting for 1918 and the following officers were elected: president, Dr. John N. Warren, Sioux City; president-elect, Dr. Max E. Witte, Clarinda; vice presidents, Drs. Michael J. Kenefick, Algona, and Elias B. Howell, Ottumwa; editor of the journal, Dr. David S. Fairchild, Clinton (reelected); treasurer, Dr. Thomas F. Duhigg, Des Moines (reelected); secretary, Dr. Tom B. Throckmorton, Des Moines, and delegates to American Medical Association, Drs. William B. Small, Waterloo; Lawrence W. Littig, Davenport, and Mathew N. Voldeng, Woodward.

MARYLAND

Baltimore

Allied Bazaar Fund Completed.—The final accounting of the Allied Bazaar at Baltimore shows receipts of $85,500 collected as follows:

Baltimore fund for relief of disabled soldiers and sailors and their families	$21,000
Great Britain and Ireland	12,500
Belgium	12,500
France	12,500
Italy	10,000
Roumania, Servia, Poland, Lithuania and Armenia	17,000

More Hospitals for Tuberculosis.—A committee composed of Drs. Henry Barton Jacobs, C. Hampson Jones and J. Hall Pleasants, and Mr. H. Wirt Steele, representing the Maryland Tuberculosis Association, has sent a letter to Governor Harrington and the Maryland Preparedness and Survey Commission in which it is urged that the legislature at the special session provide for doubling hospital accommodations for tuberculosis patients, and also for more hospitals to be erected and equipped to meet the increasing number of cases of the disease expected as a result of the war. It is also recommended that all the state tuberculosis institutions be correlated, coordinated and controlled under a state tuberculosis commission to be established by the general assembly.

Personal.—Dr. Hugh Hampton Young, director of the James Buchanan Brady Institute, the Johns Hopkins Hospital, has received notification of his appointment as major in the Medical Reserve Corps, and will leave shortly for England. With Dr. Young will go Dr. Louis C. Lehr, professor of urology at Georgetown University, and Dr. Montague L. Boyd, professor of urology at Emory University, Atlanta, Ga., who will have the rank of captains, and Dr. Howard L. Cecil of the Brady Urological Institute, who has been commissioned as first lieutenant.——Dr. David M. Davis, head of the research laboratory of the Brady Urological Institute, has sailed for France.——Drs. Sydney M. Cone and Lewis C. Spencer, Baltimore, will go with the Harvard Orthopedic Unit to France.

Meeting for Medical Preparedness.—At a special meeting held in Osler Hall, Baltimore, May 17, in the interest of medical preparedness, the principal speakers were: Col. Thomas H. Goodwin, service medical officer with the British Commission; Major Robert E. Noble of the surgeon-general's staff; Surg.-Gen. William C. Gorgas, U. S. Army, and Dr. H. Young, chairman of the Maryland Committee on Medical Preparedness. Colonel Goodwin gave a graphic description of the retreat from Mons and the battle at the Marne. Major Noble in his address said that only 4,223 medical men had been recommended for commissions in the Officers Reserve Corps, while the army would need 20,000. General Gorgas stated that the first problem confronting us is to take care of the 1,000,000 men in the army from a sanitary and medical viewpoint. "There must be the preliminary examination to determine the physical fitness of the recruit. We shall need 10,000 physicians for this duty and we shall need 6,000 men in the medical and ambulance service in France."

Mental Clinic for Maryland Offered.—Members of the Maryland Psychiatric Society have offered Adjutant-General

Warfield and the War Department their services, with two specific plans: First, that a mental clinic be established at the proposed concentration camp at Havre de Grace, and second, that receiving and convalescent stations be established for American soldiers, who may suffer from mental or nervous disorders as a result of the war. The Psychopathic Ward at the Spring Grove State Hospital has been offered as a receiving station, and a convalescent station at the Springfield State Hospital has been suggested. This latter station would be temporary, consisting of wooden buildings on the grounds of the hospital, while for the receiving station the new building at the hospital, which has just been completed and for which equipment will be asked of the extra session of the legislature, will be used. The cost of equipping both stations will be about $80,000. If the stations are authorized, probably vocational schools for the wounded also will be established, like those in France. Volunteer teachers will instruct the crippled and those whose minds are affected in trades by which they can make a living. The mental clinic would take care of all mental trouble at the concentration camp. Physicians would visit the camp on stated days and examine any soldier whose nerves had been overstrained, and arrange for the care of more serious cases. The committees appointed are: Medical: Drs. Arthur Herring, Baltimore, chairman; J. Clement Clark, Sykesville; J. Percy Wade, Catonville; Robert P. Winterode, Crownsville; William R. Dunton, Jr., Townson; Andrew C. Gillis, Baltimore; Henry J. Berkley, Baltimore, and Frank W. Keating, Owings Mills. Advisory: Daniel Randall, Senator Wade Warfield, Harry J. Hopkins, W. Champlin Robinson, William J. Ogden and Drs. Edward N. Brush and Charles G. Hill.

MASSACHUSETTS

New Surgeon-General.—The governor has announced the appointment of Dr. William A. Brooks, Boston, as chief surgeon of the National Guard, with the rank of lieutenant-colonel.

Pharmacy College Cornerstone Laid.—In connection with the commencement and class day exercises of the Massachusetts College of Pharmacy, the cornerstone of the new building for the institution was laid with appropriate exercises, May 22.

Personal.—Dr. Leverett D. Bristol, Boston, has been appointed state health officer of Nebraska under the new Fox law.——Dr. Benjamin F. Andrews has been placed in charge of the surgical outpatient service of the Worcester State Hospital. Dr. Allan J. McLaughlin, Boston, has been appointed to succeed Dr. Richard P. Strong, Boston, as chairman to the subcommittee on hygiene, medicine and sanitation of the Massachusetts Committee for Public Safety.——Dr. William T. Councilman, Boston, has returned after an absence of several months.——Dr. Frank T. Lougee has been appointed city physician of Lynn, succeeding Dr. Joseph F. O'Shea, deceased.

New District Officers.—Worcester District Medical Society, at Springfield, May 9: president, Dr. Michael F. Fallon; secretary, Dr. Ernest L. Hunt.——Franklin District Medical Society, at Greenfield, May 8: president, Dr. Harry N. Howe; secretary-treasurer, Dr. Frank A. Millett, both of Greenfield.——Essex North District Medical Society, at Lawrence, May 2: president, Dr. Thomas R. Healy, Newburyport; secretary, Dr. J. Forrest Burnham, Lawrence.——Suffolk District Medical Society, at Boston, April 25: president, Dr. Herman F. Vickery; secretary, Dr. George G. Smith.——Hampden District Medical Society, at Springfield, April 24: president, Dr. John M. Birnie; secretary, Dr. Hervey L. Smith, both of Springfield.

MINNESOTA

Sanatorium Notes.—The tuberculosis sanatorium, which has been under construction at Granite Falls for the last two years, was formally opened to receive patients, April 29. The institution is the sanatorium for Yellow Medicine, Chippewa, Lac qui Parle and Renville counties, has been erected at a cost of $90,000, and has accommodations for forty patients.——Dr. Merton Field, St. Peter, has purchased the Miles B. Johnson residence, which will be converted into a hospital and sanatorium.

Personal.—Dr. George B. Weiser, New Ulm, was knocked down and run over by an automobile, May 3, sustaining painful injuries.——Dr. Charles A. Lester, Winona, fell in a gymnasium, April 26, fracturing his patella.——Dr. Walter H. Darling, Minneapolis, has returned after nearly a year of service on the western front.——Dr. John P. Rosenwald, Minneapolis, has been commissioned first lieutenant, M. C., Minn. N. G., and assigned to duty with the First Field Artillery.——Dr. Edward H. Trowbridge has resigned as assistant superintendent of the Minnesota School for the Feebleminded, Faribault.

Medical Board Changes.—Dr. Charles L. Schofield, Benson, has been appointed a member of the state board of health, to succeed Dr. Winslow C. Chambers, Blue Earth.——Dr. Edward T. Sanderson, Minnesota, has been appointed a member of the state advisory commission for tuberculosis.——Dr. Egil Boeckmann, St. Paul, and Dr. Christopher Graham, Rochester, have been reappointed members of the state board of health.——Dr. George B. Weiser, New Ulm, has been appointed a member of the State Board of Medical Examiners, to succeed Dr. Frank R. Weiser, Windom.——Dr. Arthur M. Eastman, Minneapolis, has been appointed a member of the board, to succeed Dr. Robert D. Matchan, Minneapolis, and Dr. Ida A. MacKeen, Minneapolis, has been appointed a member, to succeed Dr. Annah Hurd, Minneapolis.

Special Fellowships.—Fellowships in ophthalmology and otolaryngology in connection with the University of Minnesota have been established by Dr. Frank C. Todd of Minneapolis and Dr. Frank E. Burch of St. Paul, both of the School of Medicine. These fellowships carry with them the same stipend that is paid by the University of Minnesota to the university fellows, namely, $500 the first year, $750 the second year and $1,000 the third year. Such fellows will spend half their time in the private clinic of Dr. Todd or Dr. Burch, and the other half in laboratory and clinical work and in pursuit of certain courses for specialists in ophthalmology and otolaryngology at the university. For work done in these private clinics, credit will be given toward the degree granted by the university in the course of ophthalmology and otolaryngology given at the University of Minnesota, to accepted doctors of medicine covering a period of three years which prepares the physician for the specialty of ophthalmology and otolaryngology. Applications for these fellowships may be made to the chief of the department, Dr. Frank C. Todd, Minneapolis.

MISSISSIPPI

Hospital Notes.—The Matty Hersee Charity Hospital, Meridian, which was closed, March 6, on account of lack of funds, was reopened April 1, as the result of public subscription. The state appropriation of $11,000 for the institution is still unavailable.——Work on the South Mississippi Charity Hospital, Laurel, has been started and it is expected that the institution will be ready for occupancy in September. The hospital site is at Lakeview, on a hill overlooking the lake near the Marathon Mill.

Personal.—Major John H. Allen, M. C., Nashville, Tenn., has been assigned to duty as officer in charge of sanitation and to make arrangements for necessary hospital facilities at the camp at Vicksburg, Miss. He will go to that city for a conference with Lieut.-Col. Willard D. Newbill, Quartermaster Corps, in regard to the sanitation of the camp for the national memorial celebration and peace jubilee to be held there. He will be on duty at Vicksburg until the close of the camp.——Dr. Kutcher T. Klein, for several years superintendent of the Matty Hersee Charity Hospital, Meridian, resigned, May 1, and Dr. Thomas D. Bourdeaux was elected his successor.——Dr. John L. Trice, Tupelo, has been appointed surgeon in charge of the Natchez Hospital, and Dr. Clarence E. Mullens, Slingerlands, N. Y., assistant surgeon.

NEW YORK

Personal.—Dr. Henry T. Williams has resigned as president and director of the Rochester Public Health Association.——Dr. Howard Lull Van Winkle, Kingston, has been appointed bacteriologist of Ulster County at a salary of $2,000.

Money Raised for Hospital.—At a meeting of the Williamsburgh Hospital Campaign Committee, held April 30, it was reported that $189,703, of the $200,000 required for the institution had been received in the first sixteen days of the campaign.

Marriage Bill Becomes Law.—Governor Whitman has signed the Whitney bill which requires that those who apply for marriage licenses in New York State shall present affidavits that they are free from communicable diseases. The affidavits filed must contain sworn statements that the affiant has never had venereal disease, or that laboratory tests show that such diseases are not now present.

Sale of Skimmed Milk Legalised.—The Wicks bill, which provides that the prohibition contained in the law regulating the sale of adulterated milk shall not apply to skimmed milk which is clean, pure, healthy, wholesome and unadulterated, except by skimming, if it is sold for and as skimmed milk, has been passed by the legislature. This bill also stipulates that prohibitions against the sale of cheese made from adulterated milk or cream shall not apply to pure skim-cheese made from milk which is otherwise clean and pure except by skimming. This act is to take effect immediately.

Civil Service Examinations.—The State Civil Service Commission announces that on June 23, open competitive examinations will be held throughout the state for the following positions:

Assistant Medical Examiners of Schools, education department; salary $3,000; open to men only.

Assistant in Pathology, State Institution for the Study of Malignant Disease, Buffalo; salary $1,800; applicants must be under 28 years of age and graduates of Class A medical schools or foreign universities of equal standing.

Bacteriologist-Pathologist, state department of health; open to men and women; salary $2,500; degree in medicine or an equal education desirable.

Physician, State Institution for Feeble-Minded Children, Syracuse; salary $1,800; open to men and women under 30 years of age.

Applications for these positions will be received at the office of the State Civil Service Commission, Albany, not later than June 13.

New York City

St. Luke's Hospital Ready for Home Defense Service.—Rev. Dr. George F. Clover, superintendent of St. Luke's Hospital, announces that the Norris Pavilion of the hospital will be opened for service, May 21, for the treatment of minor defects of men who have applied for enlistment and have been rejected. Thirty beds in the pavilion are ready for occupancy.

Sue Milk Company for Typhoid Epidemic.—Residents of South Brooklyn and Bay Ridge have begun sixteen lawsuits asking for a total of $306,000 damages from the Ideal Dairy Company, Brooklyn. It is alleged that the milk supplied by this company was the cause of a number of cases of typhoid fever and several deaths in 1915. It is stated that the charges will be vigorously denied, as the cause of the epidemic has never been officially established.

Venereal Disease.—The New York State Department of Health devoted the entire May issue of *Health News* to the discussion of venereal disease, giving authoritative information as to the extent of these diseases and the methods by which they are being combated. The attitude is wholly from the standpoint of health, and did not consider the moral factors involved, but left this part of the subject to other agencies.

Oral Hygiene Week.—The *Bulletin of the Bureau of Public Health*, May 11, dealt with Oral Hygiene Week. May 15, 150 dentists, members of the first and second district dental societies, visited the public schools and gave short talks to the children on the importance of proper care of the teeth, and on the next day, compositions written by the children, on the subject of the talk given them by the dentists, were read in the schools.

Conference of Charities and Correction.—The eighth New York City Conference of Charities and Correction was held in Brooklyn, Manhattan and Dobbs Ferry, May 22-24, under the presidency of Mr. Leopold Plaut, New York. The sections under which the conference worked were: Families; Public Health, Publicity and Administrative Methods; Recreation and Delinquency, and Children. Dr. S. Adolphus Knopf, chairman of the Public Health Committee, made a report before the Public Health Section, and papers were read on "Constructive Suggestions Toward the Control of the Most Important Infectious Diseases," Dr. S. Josephine Baker, considering the subject from the viewpoint of child life, and Dr. Ira S. Wile from that of adult life.

Personal.—Dr. I. Seth Hirsch has resigned as director of the Roentgey-ray department of the Post-Graduate Hospital and Medical School to accept a similar position in Bellevue and Allied hospitals.——Dr. Martha J. Peebles, Brooklyn, while cleaning a revolver at her summer home near Stroudsburg, Pa., accidentally shot herself, and is under treatment at the Monroe County Hospital, Stroudsburg.——Dr. Linsyl R. Williams has succeeded Dr. John S. Billings as deputy health commissioner of New York City.——Dr. Henry H. M. Lyle, who recently returned after two years' service on the western front, read a paper on "The Base Hospital in France" before the Wayne County Medical Society, Detroit, April 23.——Capt. John A. Quell, Brooklyn, has resigned from the Medical Corps of the First Cavalry, to become a passed assistant surgeon in the navy.

NORTH CAROLINA

Auxiliary Medical Defense Committee.—The following is the Auxiliary Medical Defense Committee of Wake County, N. C.: Drs. Augustus W. Knox, chairman; Hubert A. Royster, Robert P. Noble, James W. McGee, Louis N. West, Albert S. Root Henry G. Turner, James H. Payne, U. S. Navy Recruiting Station; Watson S. Rankin, Raleigh; James M. Templeton, Cary; Charles B. Wilkerson, Apex; John L. Moore, Wendell; William T. Carstarphan, Wake Forest.

NORTH DAKOTA

Personal.—Dr. John W. Cox of the state public health laboratories, Grand Forks, has returned to the university after having been a month in the United States Public Health Service, in Okmulgee County, Okla.——Dr. Charles J. McGurren, Devils Lake, was appointed state superintendent of public health and secretary of the state board of health.

New State Officers.—The thirteenth annual meeting of the North Dakota Medical Association was held in New Rockford, May 9-10, under the presidency of Dr. Victor J. La Rose, Bismarck. Fargo was selected as the place of meeting for 1918, and the following officers were elected: president, Dr. George M. Williamson, Grand Forks; vice presidents, Drs. Edgar A. Pray, Valley City; William P. Baldwin, Casselton, and Fred E. Ewing, Kenmare; secretary, Dr. Hezekiah J. Rowe, Casselton (reelected); treasurer, Dr. William F. Sibler, Devils Lake; delegate to the American Medical Association, Dr. Charles MacLachlan, New Rockford; alternate, Dr. James P. Aylen, Fargo, and councilors, Drs. Paul Sorkness, Fargo; John E. Countryman, Grafton; Francis R. Smyth, Bismarck. The association recommended for members of the state medical examiners board, Drs. Joseph C. Suter, Grafton; Albert W. Skelsey, Fargo, and Archibald D. McCannel, Minot, and for member of the Medical Defense Board, Dr. Andrew Carr, Minot.

PENNSYLVANIA

No Change in Requirements.—A resolution recently passed by the Pennsylvania Bureau of Medical Education and Licensure states that inasmuch as the Council of National Defense has announced that no changes in the usual procedure of medical schools are made necessary to supply physicians in the present national emergency, the bureau declines to make any modification in the requirements in medical education as demanded by the laws of Pennsylvania.

Personal.—Dr. William W. Keen, emeritus professor of surgery in Jefferson Medical College, and president of the American Philosophical Society, fell, May 17, severely injuring his right shoulder.——Dr. De Forrest P. Willard of Lansdowne has joined the Orthopedic Unit of the United States Army and will be commissioned a captain.——Dr. Harold L. Amoss and Dr. Royal S. Haynes of New York read papers before the joint meeting of the Philadelphia County Medical and the Philadelphia Pediatric Societies on May 23, on "The Mechanism of Defense and Serum Treatment of Poliomyelitis" and "The Early Recognition of Acute Anterior Poliomyelitis and its Importance in Respect to Treatment," respectively.

RHODE ISLAND

Personal.—Dr. Arthur W. Stevenson, Newport, has returned from Europe, where he served in military hospitals on the war front.

New Officers.—At the annual meeting of the Pawtucket Medical Association, Dr. Charles H. Holt was elected president, Dr. Ardashes H. Merdinyan, vice president; Dr. Earl J. Mathewson, secretary-treasurer, and Dr. Stephen F. Hughes, treasurer.

SOUTH CAROLINA

Personal.—Dr. William C. Sandy, Jr., medical director of the State Hospital for the Insane, Columbia, has resigned to accept the appointment of the assistant superintendent of the State Hospital for the Insane, Middletown, Conn.

District Association Meet.—The Third District Medical Association held its annual meeting at McCormick, April 11, and elected Dr. Rallie M. Fuller, McCormick, president; Dr. Jesse H. Teague, Laurens, vice president, and Dr. James S. Fouche, Ninety-Six, secretary-treasurer. Laurens was selected as the next place of meeting.

WISCONSIN

Surgical Association Elects Officers.—At the annual meeting of the Wisconsin Surgical Association, held in Milwaukee, May 9, Dr. Horace M. Brown, Milwaukee, was elected president, Dr. John F. Pember, Janesville, vice president, and Dr. Daniel Hopkinson, Milwaukee, secretary-treasurer (reelected).

Personal.—Dr. Othoa Fielder, Sheboygan, a member of the state board of health, was operated on recently for appendicitis, and is said to be doing well.——Dr. Erwin C. Cary, Reedsville, who has been ill with pneumonia in the Holy Family Hospital, Manitowoc, is convalescent and will soon return home.

Hospital Items.—At a meeting of physicians in the office of the Health Department of Milwaukee, April 30, it was recommended that a new and centrally located emergency hospital be established with a capacity of five hundred beds, to replace the present emergency hospital.——The directors of the Dodgeville General Hospital have closed negotiations for the purchase of the residence of Mrs. D. H. Williams, which, after remodeling, will be opened as a sanatorium.

CANADA

University News.—Queen's University, Kingston, Ont., is holding a special course, commencing May 15, for a number of medical students who went overseas with the Queen's Base Hospital.

Hospital News.—The Galt (Ont.) General Hospital is providing for a children's ward.——The medical men of Winnipeg, Man., have made an offer of a base hospital for service in France.——A new isolation hospital is to be built at Saskatoon, Sask.——The building of a new sanatorium at Fort Qu'Appelle, Sask., has been commenced. The work on this institution was suspended at the outbreak of war.

Typhoid Fever.—There is an outbreak of typhoid fever at Orillia, Ont., due, it is said, to failure of that town to pasteurize its milk supply.——Typhoid fever has been prevalent in parts of the province of Quebec. A number of cases have occurred in Montreal, Sherbrooke, Lachine, St. Johns, Farnham, St. Hyacinthe, Sorel, and Levis.——The situation as regards typhoid fever in Edmonton, Alta., has been encouraging during the past year. There were only eight cases contracted in that city during the past year, and only one death.

Banquet to Major Mayrand.—Major R. Mayrand, professor of electrotherapy at Laval University, Quebec, was tendered a banquet on his recent return to Quebec from the seat of war. He served at the Valcartier camp and sailed with the first Canadian unit, the only representative of the French Canadians in this first hospital corps, which served first at Hampstead, then at Boulogne in France and later was stationed at Lemnos, where the equipment for 400 patients was swamped with 800 patients suffering from dysentery, and nearly the whole of the personnel were affected also. The hospital was then sent to Alexandria and Saloniki, where malaria took the place of dysentery. Then the hospital was recalled and will probably be sent to France next, where Major Mayrand expects to rejoin it. The banquet was tendered by the medical service of the Hotel Dieu, to which he is attached, and by the Laval University.

Public Health.—Dr. John W. McIntosh, Vancouver, B. C., speaking in the British Columbia legislature, referred to the unsatisfactory way in which problems connected with public health were dealt with in the province of British Columbia. In the city of Vancouver the death rate from tuberculosis, instead of decreasing, has increased by 43 per cent. during the period elapsing between the years 1904 and 1914; and in Victoria during the same period it has increased by 58.5 per cent. In Vancouver 15 per cent. of all deaths are due to tuberculosis. Dr. McIntosh contrasted these figures with those of the province of Ontario, where the death rate from this disease has diminished by as much as 40 per cent. He objected to the treating of advanced and incipient cases side by side in the same hospital, and thought that incipient cases only should be treated in the institution at Tranquille. As much had been done in recent years by the employment of the tuberculin test in cattle, he considered that within the next three or four years the cattle in British Columbia would be free from tuberculosis.

Personal.—Lieut.-Col. George R. Philip, Toronto, after being in France thirty months, has been recalled for important duty which is to be assigned him.——The report published that Lieut.-Col. George E. Armstrong, Montreal, had relinquished his temporary commission in the Canadian Army Medical Corps is now stated to be incorrect. Dr. Armstrong is remaining in England.——Dr. Walter Connell, professor of pathology, bacteriology and sanitary science in Queen's University, Kingston, Ont., has been appointed to the command of the new Queen's Military Hospital at Kingston.——Lieut. Ray V. McCarley, M.D., Vancouver, B. C., has left for England to join the Royal Army Medical Corps.——Dr. Hyman Lightsone, R. A. M. C., Montreal, has been awarded the medal of honor by the French government in recognition of services rendered in combating an epidemic of typhoid fever in the district of Querrien, Point Noyelles.——Capt. W. Norman Gilmour, M.C., R. A. M. C., Brockville, Ont., medical officer of the 16th Royal Scots, is in hospital at Boulogne, France, with a fractured right humerus.——Stewart S. Skinner, M.B., has resigned as registrar of the College of Physicians and Surgeons of New Brunswick and is leaving for overseas. Dr. John S. Bentley, St. John, has been appointed to succeed him.

GENERAL

Prophylaxis of Cancer in Porto Rico.—A propaganda committee has been appointed in Porto Rico, affiliated with the Cancer Commission of the United States, to educate the public in the prophylaxis of malignant disease. The committee includes six physicians with Dr. J. G. Brioso as chairman.

No Separate Health Department for Brooklyn.—A bill providing for a reconstruction of the city health department whereby Brooklyn would have an independent health department has been vetoed by Mayor Mitchell, who holds that instead of improving health administration, it would tend to make it less efficient than it is now, and would add a considerable burden to the taxpayer.

Union Endorses Industrial Hygiene Work.—The Amalgamated Lithographers of America recently adopted resolutions which have been sent to the mayor in which they express appreciation of the importance of the work of the Division of Industrial Hygiene and assure the department of health that the Division of Industrial Hygiene will have the support and cooperation of this union.

Georgia Railway Surgeons Meet.—The annual meeting of the Central of Georgia Railway Surgeons Association, held in Macon, May 3, the following officers were elected: president, Dr. Louis E. Broughton, Andalusia, Ala.; vice presidents, Drs. Alfonso J. Mooney, Statesboro, Ga., and Agnew H. Hilsman, Albany, Ga., and secretary-treasurer, Dr. Walter E. Saunders, Arlington, Ga.

Smallpox.—During the five weeks ended April 27, 1917, according to *Public Health Reports*, May 11, 1917, there were reported from seventy cities of the United States 1,157 cases of smallpox. The high points of the disease were reached in Minneapolis, where there were 154 cases, and in Austin, Tex., where there were 76. The disease was mild everywhere, except in Austin, where it is said the virulent type was present.

Dental Hygienists.—Next month ninety-six young women will be graduated from the Columbia University School of Oral Hygiene. This will be the first class of this kind graduated. Through these "dental hygienists" the department of health will inaugurate a new method of looking after the teeth of schoolchildren. The graduates in dental hygiene have been taught how to examine teeth and to clean them with instruments, and as soon as they are graduated will enter on this work in the schools.

The Teeth of Schoolchildren.—Oral Hygiene Week has brought out statistics with reference to the teeth of schoolchildren. Last year in its supervision of the health of schoolchildren the Bureau of Child Hygiene, which employs 117 physicians, 235 nurses and nine dentists, examined the teeth of 275,000 children and found that 166,000 children had bad teeth. The department of health now maintains eight special dental clinics in schools in various parts of the city. Since these clinics started in January, 1913, they have treated approximately 45,000 children. Altogether 65,000 teeth have been extracted and 20,000 filled. The department of health feels that the facilities for the care of the teeth of New York children are developing satisfactorily.

Food Expert Brinkler Seeks Abrogation of Fraud Order.—George H. Brinkler, who has posed nationally for some years past as a food expert and dietist, has petitioned the supreme

court of the District of Columbia to compel the postmaster general to abrogate a fraud order issued Aug. 19, 1914, barring Brinkler from the use of the mails. Brinkler was tried before a jury in Washington, D. C., in January last, on a charge of using the mails to obtain money under false pretenses, and was acquitted, but the postmaster general has allowed the fraud order to remain in force. To a request from Brinkler for the abrogation of this order the postmaster general replied that he found that the order had been properly issued and that its revocation for the purpose of permitting the resumption of a business found by the postoffice department to be fraudulent was not warranted.

FOREIGN

Deaths in the Profession Abroad.—**H. R. Jones** of Liverpool, aged 53, noted for his important work in training medical men for the diploma of public health, as well as for statistical and pathologic research.——**C. P. M. Boeck,** until recently professor of dermatology at the University of Christiania, aged 71. He founded in 1880 the journal now known as the *Tidsskrift for den norske Lægeforening.*——**v. Delsaux,** professor of otology at the University of Brussels, founder and editor of the *Presse Oto-rhino-laryngologique.*——**F. Labadie-Lagrave,** a well-known gynecologist and obstetrician of Paris, aged 73.——**P. Cruet,** pathologist and prosector at the University of Paris, aged 34.——**Gairal,** mayor of the town of Carignan, vice president of the Association générale des médecins de France and president of the Union des syndicats médicaux. His medical diploma dates from 1872.——**G. Jäger,** formerly professor of hygiene at Stuttgart, aged 84. His name is familiar on account of his invention of the clothing material that bears his name.

Death of Presiding Officer of Nobel Medical Prize Committee.—K. A. H. Mörner, professor of chemistry and pharmacy at the Karolinska Medico-Chirurgical Institute of Stockholm, died recently, aged 62. Since 1892 he has been rector of the institute, in which position he participated in drawing up the regulations for the prizes of the Nobel Prize committees, and since has been president of the Nobel Medical Committee. Count Mörner spoke several foreign languages well, and his addresses on the prize winners, their work and achievements, at the ceremonies of conferring the Nobel Prize in medicine, are said to have been a conspicuous feature of the Nobel presentation ceremonies, much appreciated by the Swedish lay public as well as by the profession. He spoke to Golgi in Italian, in awarding him the Nobel Prize, to Ramon y Cajal in Spanish, and to Pawlow in Russian, as well as in English to Ross and Carrel, and in French and German to the other recipients, making a short address in the recipient's own language as he presented him with the prize. Mörner's research and publications in the line of chemistry, especially physiologic chemistry, toxicology and chemical analysis, were notable. A work of his on physiologic albumin in the urine was awarded the Alvarenga Prize in 1895.

LONDON LETTER

LONDON, April 28, 1917.

Vital Statistics for the Year 1915

The annual report of the registrar-general for 1915 has just been issued. As that was the first complete year of the war, the figures are unusually interesting. They are remarkable for the number of previous records which are broken. The marriage rate was the highest on record. The birth rate was the lowest. The death rate from typhoid fever was the lowest on record; that from influenza the highest since 1900, and that from measles the highest since 1896. Again, the age rates of spinsters marrying bachelors and of bachelors marrying spinsters were both the highest on record. Finally, the increase of boy babies over girls from July, 1915, to June, 1916, was the highest on record for fifty years. This seems to bear out the superstition that war causes a relative increase in the male as compared with the female birth rate. The idea, of course, is that Nature tries to compensate for the loss of male life in battle. The marriage rate was 19.5 per thousand, being 3.6 above the rate for 1914. The provisional figures for 1916, however, indicate that the marriage "boom" is passing. The birth rate was 22 per thousand, which is 3.5 below the average for the preceding ten years and 1.8 below the rate for 1914. But this rate compares favorably with that of other belligerent nations. The provisional rate for 1916 is still lower, being 21.6. The infant mortality during the year was 110 per thousand births. This is 5 above the rate in 1914, but below the average of the years 1905-1914. The provisional infant mortality rate for 1916 shows a fall to 91, the lowest on record. The civilian death rate was 15.7 per thousand, which is 1.2 above the average for the preceding ten years. However, various factors affect this rate, such as the withdrawal of many young men from civilian life. Most of the principal causes of death showed increased mortality, but scarlet fever, typhoid fever and diarrheal diseases were exceptions. Cerebrospinal fever showed an abnormally high death rate. A curious fact is a remarkable decrease in the number of male suicides. Thus suicides by poison numbered over 500 in 1913, the last complete peace year, while in 1915, the first complete war year, they were only about 300. Various explanations have been suggested. One is the increased price of poisons. But it seems more probable that the war by engrossing attention has to a certain extent diminished the introspection and the preying of personal troubles on the minds of morbidly inclined persons. There was a marked increase of tuberculosis among males and a slight increase among females. It must be borne in mind that these rates refer only to the civil population and are swollen by the healthy males taken away from civil life in large numbers. The average age of bachelors marrying spinsters was 27.33 years, and of spinsters marrying bachelors 25.47. The ratio of male to female births was 1,040:1,000. For the year July, 1915, to June, 1916 (the first complete year during which the births registered have been fully affected by the war), the ratio is still higher, 1,047:1,000. These ratios may be compared with that of the March quarter of 1915, which was not affected by the war and was 1,032:1,000.

PARIS LETTER

PARIS, April 26, 1917.

The War

TREATMENT OF EMPYEMA FOLLOWING FIREARM WOUNDS OF THE CHEST

The present treatment of empyema consists of free drainage, the injection into the pleural cavity of a liquid to prevent the stagnation of the pus, and the expansion of the lung, with or without respiratory gymnastics, so that the lung and the parietes may come in contact with each other. When neither of these expectations is realized, there is initiated a long and unsatisfactory period of successive resections of the ribs, by the operation of Estlander or its modifications. Depage and Tuffier have devised a method of treatment consisting of two steps: First, pleurotomy is performed and the pleura sterilized, then the operation wound is closed. Depage and Tuffier have applied Carrel's method to these suppurations, that is to say, progressive sterilization by means of neutral solution of chlorinated soda used according to Carrel's method. When the bacteriologic findings are such as to indicate sterilization, the wound is closed and transformed into a sterile cavity, a closed pneumothorax, that will resolve itself spontaneously and permit of the contact of the lung and the chest walls.

The first step also includes the exploration of the pleural cavity in order to ascertain its extent, direction and the presence of diverticula. Direct examination with the finger, an instrument or an endopleural light gives exact information. Roentgenography of the chest, after a series of rubber tubes threaded with silver wire have been placed in the pleural cavity, shows the threads penetrating all the diverticula and indicates their depth, direction and extent. This exploration having been made, the tubes employed in the Carrel method are introduced into all the diverticula. Injections of the neutral solution of chlorinated soda are continuous or intermittent, every two hours. The dressing is changed every twelve or twenty-four hours. The temperature falls rapidly and the suppuration diminishes, so that when the point of sterilization is reached the compress maintained in the wound may be stained with only a few drops of fluid in twenty-four hours. This sterilization is obtained rapidly in recent cases, and is equally rapid, as has been shown, in benign cases (diplococcus, pneumococcus). It is much more difficult to secure, especially to maintain, in chronic cases. Five or six days after this sterilization has been obtained, they proceed to the closure of the wound, and for that, especially when it is a recent case, local anesthesia suffices (three or four injections of stovain at the point of suture). They use deep sutures of catgut and superficial sutures of silkworm-gut. One suture, including muscles and skin, passing as nearly as possible to the pleural cavity, is sufficient, and they obtain thus perfect primary union. The deep raw surface not sutured and in contact with the pleura need not

be disturbed, as it is sterile and heals without giving any trouble. The results of the operation are that the wound unites, the temperature becomes normal, the wound becomes cicatrized, and the respiration extends to all parts of the lung. During the period of healing the patient is required to make expiratory efforts in such a way as to distend the lung as much as possible.

The method is applicable in certain nonsurgical cases of purulent pleurisy as well as in traumatic pleurisies. Of twelve observations of Depage and Tuffier, ten were cases of traumatic pleurisy (in three of which there were bronchopleural fistulas), and two were nonsurgical purulent pleurisies. Of the ten traumatic pleurisies, five were the result of wounds from shell fragments, four from bullet wounds, and one from a fragment of a bomb. In two cases, thoracotomies were performed on the day of the wounding. The other interventions had taken place from nine to seventy-seven days after the wounding. The time elapsing between the wounding or the beginning of the lesion and the closure had been from twelve days to a year. As a result of treatment, in seven cases there was complete recovery; in four others the results were uncertain; in one case the patient was still under treatment.

Summarizing, Depage and Tuffier think that a purulent pleurisy can be sterilized in many cases by the method of Carrel; when the pleurisy is sterile, the operation wound can be closed without disturbing the cavity underneath. In a certain number of cases the outcome can be improved, and this Depage and Tuffier insist should be attempted.

In line with the communication of Depage and Tuffier, Toussaint declares that he is always able to prevent persisting pleural fistulas for which the two surgeons have conceived their treatment, treating the empyema thus, as soon as it is diagnosed: thoracotomy with resection of the rib at the base; introduction of the index or index and middle fingers into the pleural cavity; detachment and extraction of the false membrane—a veritable curettage of the pleura—drainage with two drains; irrigation every other day with 25 per cent. hydrogen peroxid, and dressing with levigated boric acid powder in case of blue pus. Thanks to this technic, displacement of the lung is prevented and we are assured of the emptying and disinfection of the pleura, a cure without a persistent fistula, and the more or less rapid return of the patient to the front.

TREATMENT OF SALIVARY FISTULA FOLLOWING WAR WOUNDS

Morestin, who has treated sixty-two cases of such fistulas (of which thirty were of the gland, thirty of the canal and two involving the gland and the canal), presented to the Paris Surgical Society the results of his experience. The treatment of fistulas following war wounds may be reduced to a few simple rules: First, it is unnecessary to say that many of these fistulas close spontaneously. The indication, the most common and the most essential from the point of view of operative technic, is to extirpate with the greatest care the entire fibrous mass and the fistulous tract, preserving the soft and healthy tissues; when it is a fistula of the gland, to bring together the sides of the glandular excavation by layers of sutures and to seal hermetically the orifice that allows the escape of the saliva. For fistulas of the canal of Stenson, while it is true that satisfactory results may be obtained by divers procedures, it seems that only two are applicable in the cases actually presenting: the extirpation of the fistula, the mass of fibrous tissue and the mutilated portion of the canal, with establishment of drainage into the mouth, or extirpation with ligature and burying of the stump of the canal. Either method will cure the patient, but in case the first fails to secure the establishment of an artificial canal, the second seems more tempting, more clear, more rapid, and appears, in consequence, particularly to be recommended.

NECESSITY FOR TREATING SPINAL DEFORMITIES

Having ascertained that subjects of spinal deformities have been kept in the base hospitals for prolonged periods without being subjected to neurologic examinations permitting the determination of their condition and the institution of treatment which frequently would produce rapid benefit, the Neurological Society of Paris has expressed the view that all subjects presenting spinal deformities hospitalized in the sanitary formations of the rear should be sent to the regional neurologic centers and given the necessary roentgenologic and neurologic examinations and treatment appropriate to their condition, and also that the proper medicomilitary measures may be taken in regard to theim.

WATERPROOFING CLOTHING AND SHOES

Nievenglowski has communicated to the Academy of Sciences a formula for waterproofing shoes and clothing. It consists of a solution of paraffin in gasoline in the proportion of 30 gm. per liter. It is employed cold for clothes by dipping them into the solution. For shoes it may be applied warm with the aid of a brush. The procedure preserves for cloth and leather their softness and their color, and in addition has the advantage of waterproofing uniforms without requiring removal of the buttons, ornaments or insignia.

INDUCED ERUPTIONS IN SOLDIERS

Milian, physician to the hospitals of Paris, at the medicosurgical reunion of the Fifth Army, called attention to the increasing number of induced eruptions of variable clinical aspect. These artificial eruptions are grouped under several types, of which the most interesting are:

1. Eczema-like eruptions that represent well the aspect of induced dermatites, but of which as such the diagnosis is always difficult. They present frequently the characters of acute facial eczema, but subside in four or five days. Relapses appear suddenly and early in the morning, and the lesions present at once the maximum development of the eruption. One never encounters the minute vesicles of eczema, or the depression following the rupture of the vesicles.

2. Pustular eruptions, which are more frequent than the preceding. They are characterized by the eruption, on the hairy parts, by preference, in local regions easily accessible, of little pustules, full, nonumbilicated, frequently surrounding individual hairs; but these pustules have no areola and are all of the same age. They disappear completely in a few days. Relapses frequently follow, also, in series, suddenly and in the morning. The lesions may be confounded with the pyodermatites and nontrychophytic sycosis.

3. Pemphigoid eruptions, more rare, manifested by the appearance of great bullae or phlyctens, sometimes of the size of a large hazelnut, with a base of healthy skin, without redness, disappearing quickly in a few days, but reproducing themselves in the form of successive explosions.

4. Persistent sores, maintained with the aid of caustics or vesicants, presenting, sometimes, difficulty in diagnosis from gummatous ulcers.

5. Mucous plaques, resembling those of syphilis, well treated, but returning with new lesions in the mouth, resembling the mucous plaques of the inside of the cheeks, of the lower lip, or of the velum palati. But the eruptions on the fauces are ulcerations rather than papulous eruptions, there is no inflammatory reaction, there is no tendency to cicatrization, and they occur in crops. They are lesions produced by burns and not mucous plaques.

The diagnosis of induced eruptions is always difficult. The admission of fraud is obviously rare. The usual means of diagnosis consists especially in the lack of frankness of the subject, the absence of the signs characteristic of each eruption, the irregularity of the symptoms, the presence or exaggeration of abnormal signs, the provocation of a new eruption on a disguised suggestion, the spontaneous and rapid cure, the relapses, sudden and in series, etc.

WORKSHOP FOR THE CRIPPLED

The president of the republic recently visited, at Grand-Palais, one of the most interesting institutions established since the beginning of the war. The Union of the Foreign Colonies in France, which was organized to help the victims of the war, consists of generous philanthropic foreigners. As stated in a previous letter (THE JOURNAL, July 22, 1916, p. 297), the purpose of this foundation is to reeducate crippled and mutilated soldiers, so that they may return to civil life with a feeling of self-confidence. The institution at Grand-Palais represents only one result of the work done. Other activities of this foundation are the following: (1) the so-called "placing bureau" and a medical service (rue Scribe, No. 11); (2) a boarding school for invalids while being reeducated (quai Debilly, 28); (3) a second school of professional reeducation at the Maison-Blanche at Neuilly-sur-Marne (THE JOURNAL, Sept. 16, 1916, p. 891); (4) an agricultural center, the most important, at Juvisy-sur-Orge. The president of that association is M. W. V. R. Berry, president of the American Chamber of Commerce of Paris. The secretary-general and treasurer are both well known Hollanders, MM. Joseph Ascher and M. Van Hemerst. The council of administration contains the names of all the principal bankers and merchants of the allied countries.

Association News

NEW YORK CLINICAL SESSIONS

(*Continued from page 1495*)

On account of lack of space the remainder—more than half of the clinical programs—will not appear in THE JOURNAL. The complete program is available and will be mailed to those who request it, sending to the committee a stamped addressed envelope. Address 17 West Forty-Third Street, New York City.

ADMISSION TICKETS to the Clinics, Demonstrations and Exhibits incorporated in the Clinical Sessions program will be issued *only* to members and guests who register and make application at the American Medical Association Headquarters.

GUESTS other than physicians and dentists will not be admitted to the medical and surgical clinics.

SPECIAL BADGES and BUTTONS will be issued to guests (other than physicians and dentists) of the Clinical Sessions and of the American Medical Association who wish to attend the demonstrations, moving pictures and exhibits or inspect the different nursing, medical, municipal and public health institutions arranged for in the program by the Committee on Preventive Medicine and Public Health and the Committees on Allied Topics, including Trained Nursing and Training Schools, District Nursing System, Hospital Social Service, and Planning and Financing of Municipal and Nonmunicipal Hospitals.

FELLOWS OF THE AMERICAN MEDICAL ASSOCIATION may apply in advance by mail for tickets of admission to the Clinical Sessions. In writing for the three sessions (Monday afternoon, Tuesday morning and Tuesday afternoon) give first, second and third choice, as seating capacity of amphitheaters is limited. Tickets of admission will be delivered after registration at the American Medical Association Headquarters.

GENERAL CLINICAL SESSIONS COMMITTEE

Wendell C. Phillips, Chairman

Samuel G. Gant, Sec.	**D. Campbell, Asst. Sec.**
Alexander Lambert	**Floyd M. Crandall**

Marriages

A. WEISE HAMMER, M.D., to Miss Helen Daniel von Nostrand, both of Philadelphia, at Atlantic City, N. J., April 14.

MARION ARTHUR BLANKENHORN, M.D., to Miss Martha Findley Taggart, both of Cleveland, at Columbus, Ohio, May 1.

LONNIE ALFONSO COFFIN, M.D., Farmington, Iowa, to Miss Gretta Harmon of Des Moines, Iowa, at Farmington, April 19.

JOSIAH BAKER HENNEBERGER, M.D., U. S. Army, to Miss Gabriella Edilena Lassell, both of Washington, D. C., May 5.

SYLVESTER DOGGETT, M.D., Bradford, Ark., to Miss Mae Wilson Thomas of Sheldon, Mo., at Nevada, Mo., May 6.

EARL OWEN REYNOLDS, M.D., Greenfield, Iowa, to Miss Clyde Rigdon of Louisville, Ky., at Greenfield, March 22.

CLARKE WILSON MANGUN, M.D., Kansas City, Kan., to Miss Vallie Hazel Hoffman of Galena, Ill., May 10.

LIEUT. PHILIP PALMER GREEN, M. C., U. S. R., St. Louis, to Miss Juliette Loving of Richmond, Va., May 5.

WILLIAM HULBERT BANKS, M.D., Hudson, Wis., to Miss Bess Gibson of Windom, Minn., April 30.

WILLIAM JOSEPH MACMURTRIE, M.D., to Miss Marie Adèle Edelman, both of Philadelphia, April 11.

CARL TEN BROECK, M.D., Princeton, N. J., to Miss Janet Rinaker of Carlinville, Ill., April 28.

WILLIAM HAL NEEL, M.D., to Miss Terres Russell, both of Bowling Green, Ky., April 18.

ROBIN W. C. FRANCIS, M.D., to Miss Laura J. Wilson, both of Cincinnati, May 2.

FRED M. SMITH, M.D., to Miss Helen Louise Bushee, both of Chicago, recently.

FRANK MATTHEW CONLIN, M.D., Omaha, at North Platte, Neb., April 10.

Deaths

Winslow Anderson, M.D., San Francisco; University of San Francisco, 1884; M. R. C. P. London, M. R. C. S. Eng., and L. S. A. London, 1891; aged 56; a Fellow of the American Medical Association, and since 1896 a member of the General Medical Council of Great Britain; founder of St. Winifred's Hospital, San Francisco; assistant to the chair of materia medica and medical chemistry and later adjunct professor of theory and practice of medicine in his alma mater; since 1896, professor of abdominal surgery and gynecology in and president of the College of Physicians and Surgeons, San Francisco; editor of the *Pacific Medical Journal* for many years; colonel and surgeon general of the National Guard of California from 1900 to 1911; died in New York, May 7.

Roberts Poinsette Islar, M.D., Waycross, Ga.; Medical College of the State of South Carolina, 1889; aged 50; a Fellow of the American Medical Association; a member of the Association of Military Surgeons of the United States; once president of the Florida State Association of Railway Surgeons and Florida Medical Association; consulting surgeon to the Plant System; major and surgeon of the First Florida Infantry, U. S. Volunteers, during the war with Spain; city physician of Waycross and at one time a member of the city council; died at his home, April 29.

Henry Winans Burnett, M.D., Providence, R. I.; Long Island Hospital College, Brooklyn, N. Y., 1897; aged 44; a Fellow of the American Medical Association; and a member of the Association of Military Surgeons of the United States; and New England Pediatric Society; a specialist in the diseases of children; formerly captain in the Medical Corps of the Rhode Island National Guard and Assistant Surgeon General; pediatrist to the Rhode Island Hospital, North End Dispensary and St. Vincent de Paul Infant Asylum, Providence; died at his home, May 7.

John M. Farrington, M.D., Binghamton, N. Y.; New York Medical College, New York, 1857; aged 84; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of New York; Surgeon of the One Hundred and Thirty-Seventh New York Volunteer Infantry, during the Civil War; consulting physician to the Binghamton City Hospital; a strong advocate of temperance; died at his home, April 19.

Daniel George Reilly, M.D., Dayton, Ohio; University of Vermont, Burlington, 1894; aged 52; formerly a Fellow of the American Medical Association, a member of the Ohio State Medical Association; consulting physician to St. Elizabeth's Hospital, Dayton, and surgeon to the various traction companies centering in that city; died in his home, April 30, from heart disease.

Lee M. Nusbaum, M.D., Storm Lake, Iowa; Northwestern University Medical School, Chicago, 1893; aged 53; a member of the Illinois States Medical Society, local surgeon for the Chicago, Milwaukee & St. Paul System; trustee of Buena Vista College; a member of the Storm Lake School Board; died at his home, May 6, from erysipelas.

Neil Watson Robinson Straw, M.D., Portland, Me.; Bowdoin Medical School, Brunswick, Me., 1877; aged 63; a Fellow of the American Medical Association; physician to the Maine Eye and Ear Infirmary, Portland, and to the Cumberland County Jail; died at his home, April 29, from angina pectoris.

A. Byron Darby, M.D., Waterloo, Ind., Eclectic Medical Institute, Cincinnati, 1863; aged 77; formerly a Fellow of the American Medical Association, and at one time president of the DeKalb County, Ind., Medical Society; for more than half a century a practitioner of Waterloo; died at his home, April 27.

John H. Wetzel, Ravenswood, W. Va. (license, W. Va., 1881); aged 62; formerly a Fellow of the American Medical Association; secretary-treasurer of the Jackson County Building and Loan Association; died in a hospital at Wheeling, April 10, from a nervous breakdown.

Harry M. Lamberson, M.D., Colorado Springs, Colo.; Medical College of Indiana, Indianapolis, 1902; aged 42; formerly a Fellow of the American Medical Association, and a practitioner of Connersville, Ind.; died at his home, April 30, of tuberculosis.

James Chapman Morrow, M.D., Bellevue, Ohio; Cleveland-Pulte Medical College, Cleveland, 1902; aged 57; formerly a member of the Ohio State Medical Association; a specialist

in surgery; died at his home, April 29, from cerebral hemorrhage.

Edwin Burchett, M.D., Seymour, Ia.; College of Physicians and Surgeons, Chicago, 1903; aged 37; a Fellow of the American Medical Association; vice president of the Peoples Savings Bank, Seymour; died in the Centerville (Iowa) Hospital, April 14.

Harry F. Kilty, M.D., Shenandoah, Pa.; Medico-Chirurgical College of Pennsylvania, Philadelphia, 1911; aged 27; a member of the Medical Society of the State of Pennsylvania; was shot and killed in his office, May 5, by the husband of a patient.

James Bedle Wainwright, M.D., Manasquan, N. J.; College of Physicians and Surgeons in the City of New York, 1877; aged 61; formerly a Fellow of the American Medical Association; died at his home, February 21, from arteriosclerosis.

Charles D. Alfred Fisher, M.D., Detroit; Western University School of Medicine, London, Ont., 1903; aged 36; a member of the Michigan State Medical Society; died in his rooms in Detroit, March 25, from cerebral hemorrhage.

William Gale, M.D., Westfield, N. J.; Long Island College Hospital, Brooklyn, 1867; aged 85; a member of the Medical Society of New Jersey; died in the Muhlenberg Hospital, Plainfield, N. J., April 15, from pneumonia.

Frederick L. Pohlmann, M.D., St. Louis; Missouri Medical College, St. Louis, 1897; a Fellow of the American Medical Association; was shot and killed in front of his office in St. Louis, May 14, by a former patient.

William Edward Baker, M.D., Chicago; Jenner Medical College, Chicago, 1900; College of Physicians and Surgeons, Chicago, 1902; aged 44; died in the Frances Willard Hospital, Chicago, May 5, from pneumonia.

Frank G. G. Denebrink, M.D., Sheridan, Wyo.; University of Munich, Bavaria, 1891; aged 53; a member of the Wyoming State Medical Society; died at Long Beach, Calif., March 11, from acute nephritis.

Royal J. Kingsley, M.D., Seattle; Hamline University, Minneapolis, 1908; aged 33; a Fellow of the American Medical Association; a specialist in surgery; died at his home, May 4, from heart disease.

George Henry Burleigh, M.D., Estelline, S. D.; Trinity Medical College, Toronto, 1900; aged 46; a Fellow of the American Medical Association; a specialist in surgery; died at his home, April 30.

Benjamin M. Cromwell, M.D., Eckhart Mines, Md.; New York University, New York, 1857; aged 82; surgeon in the Confederate service throughout the Civil War; died at his home, April 30.

Samuel Derickson, M.D., Bedford, N. Y.; College of Physicians and Surgeons in the City of New York, 1890; aged 48; died at his home, April 29, from cerebral hemorrhage.

Samuel Mercer Schell, M.D., Hamilton, Ohio; Homeopathic Hospital College, Cleveland, 1865; aged 77; died at his home, April 27, from cerebral hemorrhage.

Edwin Prouse, M.D., Windsor, Ont.; Trinity Medical College, Toronto, 1879; University of Toronto, 1888; aged 67; died at his home, January 27, from nephritis.

James H. Waddell, M.D., Wauseon, Ohio; Hahnemann Medical College, Chicago, 1886; aged 63; a veteran of the Civil War; died at his home, April 21.

John Abbott Crosby, M.D., Minneapolis; Harvard Medical School, 1882; a Fellow of the American Medical Association; aged 62; died at his home, May 1.

Luke Channeller Higgins, M.D., Parsons, Kan.; University of Buffalo, N. Y., 1868; aged 71; died at the home of his daughter in Parsons, April 9.

R. C. Kennedy, Fayetteville, Tenn. (license, Tennessee, 1889); aged 61; also a druggist; died at his home, April 21, from cerebral hemorrhage.

Richmond Simmons, M.D., De Witt, Mich.; Pulte Medical College, Cincinnati, 1878; aged 70; died at his home, April 22, from heart disease.

Charles Aristides Russell Moore, M.D., Mount Jackson, Va.; Hahnemann Medical College, Philadelphia, 1870; died at his home, April 19.

John R. Porter, Lebanon, Ind. (license, Indiana, 1897); aged 69; died at his home, March 9, from cerebral hemorrhage.

Henry H. Jackson, M.D., Chicago; Homeopathic Hospital College, Cleveland, 1865; aged 77; died at his home, April 8.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

THE CLAIMED GALACTAGOGUE EFFECTS OF NUTROLACTIS AND GOAT'S RUE NOT SUBSTANTIATED

Report of the Council on Pharmacy and Chemistry

Specific lactagogues—drugs which stimulate the secretion of milk—are unknown to science. Yet medical publications give space to advertisements of a proprietary—"Nutrolactis"—which is said to increase the milk supply of nursing mothers. Since dependence on a preparation of this kind is likely to cause neglect of the only means of increasing a scanty milk supply of nursing mothers, this proprietary and the drug "goat's rue," (*Galega officinalis*) which the proprietors hint as being the potent constituent, were subjected to a critical study to determine their possible influence on milk secretion. For this purpose the Council secured the help of A. J. Carlson, Ph.D., professor of physiology, University of Chicago. Dr. Carlson, with the aid of A. Woelfel, M.D., and Marian Lewis,* Sc.M., undertook to estimate the effect of Nutrolactis and of goat's rue on nursing dogs and goats with the intention of extending the study to nursing mothers if the animal experiments so warranted. The contribution, "The Alleged Galactagogue Action of Galega and Nutrolactis," by Marian Lewis and A. J. Carlson from the Hull Physiological Laboratory of the University of Chicago, which appears below, shows that Nutrolactis and goat's rue are without influence on the milk secretion in nursing animals.

The Council endorsed the work of Lewis and Carlson and held that the claimed galactagogue effects of Nutrolactis and goat's rue are not substantiated.

W. A. PUCKNER, Secretary.

The Alleged Galactagogue Action of Galega and Nutrolactis*

Marian Lewis, Sc.M., and A. J. Carlson, Ph.D.
CHICAGO

It is well established that the food best adapted to the energy and growth requirements of the infant is normal mother's milk. Any decrease in quantity or deterioration in quality of the maternal secretion is soon followed by a parallel impairment of growth, loss of weight, or lowered resistance to infection in the infant. The widespread occurrence of deficient milk secretion in mothers is a matter of common knowledge. The discovery of true lactagogues, or specific substances which increase the quantity and quality of the milk on being administered to nursing mothers, would therefore be of very great importance. In view of this great medical and economic interest in true lactagogues it is not surprising to find that the medical and biologic literature records discoveries of lactagogues, based on hope rather than demonstration, and that spurious lactagogues are on the market.

Some of the factors known to affect milk secretion are general health, food supply, psychic state and heredity. The mechanism of secretion and the method by which these factors affect it are imperfectly understood. In general it has been observed that milk yield improves both in quantity and in quality with improvement in general health, better food supply, and more favorable psychic state. The influence of heredity is taken advantage of by dairymen who are well

* From the Hull Physiological Laboratory of the University of Chicago.

* This investigation was begun in 1915 by Drs. A. Woelfel and A. J. Carlson.

acquainted with the potential milk production of the different breeds of cattle.

Among the substances which have been reported to stimulate milk secretion may be mentioned the extract of the posterior lobe of the hypophysis. But pituitary extract is not a true lactagogue, because its action is confined to the smooth musculature of the gland ducts, causing a more or less complete ejection of the milk already formed; it has no effect on the gland cells or the actual secretory process in the direction of increasing the milk yield. Extracts of thymus, corpus luteum, ovaries, uterus, placenta, fetus and the mammary gland itself have also been reported to have a temporary stimulating effect on the quantity of milk secreted, but when these extracts are given by mouth they are apparently without specific influence on the mammary gland.

Galega, or goat's rue (*Galega officinalis*), is an herb described in the National Formulary as being slightly bitter and astringent. In 1873, Gillet-Damotti,[1] in a communication to the French Academy, stated that this plant when fed to cows increases the secretion of milk from 35 to 50 per cent. Other French writers have affirmed that goat's rue is a lactagogue. In Germany, Fragner[2] made a preparation called Galegal, using galega as the active principle and combining it with lactose to give it a pleasant taste and make it soluble in water, milk, coffee and tea. This preparation was reported on favorably by Scherer,[3] who asserts that he obtained positive results in fifty-four of the eighty cases in which he used it.

More recently Huët[4] tested the effects of Theinhardt's Hygiama lactogene on four lactating women. This preparation is said to be composed of hygiama,[5] galega and anise. Analysis showed that it contains albumins, fat, soluble and insoluble carbohydrates, salts and water. Huët could not observe any influence from the use of this preparation, either on the quantity or on the composition of the milk secreted.

Nutrolactis[6] is a commercial preparation sold by the Nutrolactis Company of New York at $1 a bottle. The label states that it contains 5 per cent. of alcohol; that it contains fluidextracts of the family of "galactogogic plants," and that it is intended to "increase the supply of mother's milk." It is recommended to maintain quality and quantity until the end of normal lactation." Nutrolactis is also recommended for a mother debilitated by lactation. It is claimed that "Nutrolactis does not *force* the secretion of milk but merely assists such secretion." Years ago Millbank[7] reported good results from the use of Nutrolactis. After more than a year's use he concluded that it was more satisfactory than any other lactagogue hitherto employed by him, which is not saying very much, as specific lactagogues are as yet unknown. Nutrolactis is still (1916) extensively advertised in various medical journals as a lactagogue.

The Burden of Distrust

THE following unsolicited letter to the Advertising Department of an Indianapolis newspaper from a woman-reader clearly shows how bad advertising arouses public suspicion against all advertising:

"I have been suffering with rheumatism for the last sixteen months, have carefully read the different rheumatism 'cures' advertised, and faithfully tried many of them, but they are all 'rotten,' so I have not much faith in any of the advertisements I read. Of course, it is alright with the fellow that advertises his goods, he gets the money, the buyer gets worse than nothing.

"Now if you can cite me an advertised 'rheumatism cure' that really cures, I'll not only be under everlasting obligations to you, but will have more faith in advertisements.

"It seems to me it is up to you 'advertising specialists' to make those 'medicine men' either 'put up or shut up,' and can't something be done to keep such advertisements out of the papers which use pictures of women with goiter, boy with swollen jaw, men drawn over and walking with cane, etc. I think they are horrid enough to make one sick.

"Hoping that my opinion of some advertising will not offend, I am

Very truly yours,

Mrs. D. M. B.
Marion, Ind.
April 14, 1917.

ISSUED BY THE
NATIONAL VIGILANCE COMMITTEE
ASSOCIATED ADVERTISING CLUBS of the WORLD
MERCHANT'S BANK BLDG., INDIANAPOLIS

This is a slightly reduced reproduction of one of several leaflets sent out by the National Vigilance Committee of the Associated Advertising Clubs of the World. It is by such constructive work as this that public confidence in advertising is being restored.

METHODS OF INVESTIGATION

The alleged lactagogue action of galega and Nutrolactis was tested on lactating dogs and goats. In these animals the psychic factors, or suggestion, are largely eliminated. If the results had been positive or had indicated lactagogue action, the test would have been extended to nursing women. The puppies and kids were weighed before and after nursing, and a record kept of the amount of milk obtained at each nursing (the animals nursing from three to five times daily). The mothers were fed with varying doses of the drugs, and the milk yield compared with that of a control period during which no drugs were administered. An effort was made to keep the conditions of the experiments uniform throughout.

The galega was ground and mixed with the food. The Nutrolactis was mixed with food given by the stomach tube, or in some cases with a spoon. Galega was tested on two goats and Nutrolactis on one goat and nine dogs. The results are given herewith:

GALEGA

Goat 1: Control period, 1,600 gm., milk av. daily yield for 7 days.
Galega period (30 gm. galega mixed with oats), 860 gm. milk av. daily yield for 8 days.
Kids weaned at end of period.

Goat 2: Control period, 1,161 gm. milk av. daily yield for 9 days.
Galega period (30 gm. galega mixed with oats), 860 gm. milk av. daily yield for 8 days.
(25 gm. galega in same way), 810 gm. milk av. daily yield for 10 days.
Control period, 896 gm. milk av. daily yield for 6 days.

NUTROLACTIS

Goat 3: Control period, 896 gm. milk av. daily yield for 6 days.
Nutrolactis period (30 c.c. Nutrolactis mixed with oats), 658 gm. milk av. daily yield for 9 days.
Control period, 666 gm. milk av. daily yield for 5 days.

Dog 1: Control period, 176 gm. milk av. daily yield for 7 days.
Nutrolactis period (8 c.c. Nutrolactis by stomach tube), 55 gm. milk av. daily yield for 12 days.

Dog 2: Control period, 189 gm. milk av. daily yield for 6 days.
Nutrolactis period (8 c.c. Nutrolactis by stomach tube), 72 gm. milk av. daily yield for 11 days.

Dog 3: Control period, 93 gm. milk av. daily yield for 8 days.
Nutrolactis period (8 c.c. Nutrolactis on bread), 17 gm. milk av. daily yield for 5 days.

Dog 4: Control period, 28 gm. milk av. daily yield for 7 days.
Nutrolactis period (8 c.c. Nutrolactis by stomach tube), 47 gm. milk av. daily yield for 6 days.
(10 c.c. Nutrolactis by stomach tube), 43 gm. milk av. daily yield for 8 days.
Control period, 41.5 gm. milk av. daily yield for 6 days.
Nutrolactis period (10 c.c. Nutrolactis by stomach tube), 33.5 gm. milk av. daily yield for 4 days.

Dog 5: Control period, 67 gm. milk av. daily yield for 6 days.
Nutrolactis period (10 c.c. Nutrolactis on bread), 81 gm. milk av. daily yield for 6 days.

Dog 6: Control period, 40 gm. milk av. daily yield for 5 days.
Nutrolactis period (10 c.c. Nutrolactis by stomach tube), 33 gm. milk av. daily yield for 8 days.
Control period, 26 gm. milk av. daily yield for 4 days.

Dog 7: Control period, 283 gm. milk av. daily yield for 9 days.
Nutrolactis period (10 c.c. Nutrolactis by stomach tube), 155 gm. milk av. daily yield for 15 days.

1. Gillet-Damotti: Compt. rend. Acad. d. Sc., July 7, 1873.
2. Fragner: Wien. med. Wchnschr., 1910, **60**, 1033-1036.
3. Scherer: Wien. med. Wchnschr., 1910, **60**, 1033-1036.
4. Huët: Nederlandsch Tijdschr. v. Geneesk., 1914, **1**, 1353-1370.
5. Hygiama is said to be a food consisting of condensed milk, with (fatless) cocoa and cereals added to it (Encyclopedia and Dictionary of Medicine and Surgery, 1907).
6. The North Dakota Agricultural Experiment Station has recently published (Bulletin 22, 1915, p. 386) a complete chemical analysis of Nutrolactis. It contains only 0.60 per cent. solids (including strychnin and emodin). It has a bitter taste. The alcohol content was 3.5 per cent. The report concludes: "a little strychnin, a little alcohol, and a little laxative is about all there is to cause an increase in the milk secretion."
7. Millbank: New York Med. Jour., 1889, **50**, 544.

(15 c.c. Nutrolactis by stomach tube), 82 gm. milk av. daily yield for 6 days.
Control period, 33 gm. milk av. daily yield for 3 days.

Dog 8: Control period, 238 gm. milk av. daily yield for 8 days.
Nutrolactis period (20 c.c. Nutrolactis on bread), 223 gm. milk av. daily yield for 4 days.
(20 c.c. Nutrolactis on bread), 46 gm. milk av. daily yield for 6 days.

Dog 9: Control period 223 gm. milk av. daily yield for 6 days.
Nutrolactis period (10 c.c. Nutrolactis on bread), 178 gm. milk av. daily yield for 13 days.
(15 c.c. Nutrolactis on bread), 146 gm. milk av. daily yield for 5 days.

COMMENT AND CONCLUSION

Goat 1 had already been lactating for over two months, and the yield was gradually decreasing at the time the observations were begun. The administration of galega did not check this decrease. Goat 2 should have been a very favorable subject, for the kid was about a week old at the time the observations were begun. Both galega and Nutrolactis caused a decrease in milk yield of this animal. This decrease is perhaps partly due to the animal's distaste for the drugs and her consequent failure to eat as well as during the control periods.

Administration of Nutrolactis was accompanied by an increase in milk in only two animals, Dog 4 and Dog 5. A detailed examination of the records of these two dogs shows that in both cases *there was a progressive increase in milk yield during the control period* and that administration of the drug failed to accelerate this increase. On the contrary, the curve for Dog 5 takes a sudden drop immediately after the first administration of the drug.

The records of Dogs 6 and 7 show that the yield during the second control period is lower than that of the preceding periods. Although the administration of the drug in both cases was followed by a decrease in the yield, it may be urged that the drug has some lactagogue action, for its discontinuance was followed by a decrease in yield. This effect, however, is also apparent rather than real, for the data show a gradual falling off in yield during the period of administration of the drug, which decrease was not accelerated by withdrawing the drug.

Our data show that galega and Nutrolactis, when taken by mouth, and the elements of suggestion excluded, had no beneficial effect on lactation—at least so far as the quantity of milk is concerned.

Correspondence

ABROGATE THE PATENT ON SALVARSAN

To the Editor:—Considerable interest has been aroused in Congress concerning the abrogation of the patent rights on salvarsan. This drug was patented by Ehrlich and Bertheim, citizens of the German empire. These patents were assigned to Farbwerke vorm. Meister, Lucius and Bruening of Hoechst a. M., Germany, a corporation. No American name so far as we could learn was mentioned.

There is a branch of this firm, or an agent, in New York who has entire charge of the sales in the United States. The patents are very comprehensive and cover the process of manufacture, the chemical substance, the method of putting it into ampules, the process of preparation just prior to its being used and, finally, the name is trade-marked. Under the patent on the process of manufacture No. 986144, there are five separate claims. In order to show the breadth of these rights we cite claim No. 3:

> "The process of manufacturing new arsenical remedies, which consists in treating nitrooxyphenylarsinic acids with a strong reducing agent, as hereinbefore described."

By this it will be seen that the use of any strong reducing agent on any of the substances belonging to the group of nitrooxyphenylarsinic acids is forbidden. This is such a basic reaction and such a comprehensive claim that the manufacture of all allied processes is absolutely blocked.

Furthermore, there are eight claims on the ampules containing the substance with a nonoxidizing gas, and, lastly, there are seventeen claims on the final precipitation and redissolving with sodium hydroxid just prior to its being injected. It would appear from this that a physician would infringe the patent rights if he used this method of preparation on any salvarsan or similar compound not made by this German firm. These patents run for seventeen years, but apparently the trademark on the name "salvarsan" is permanent. It is a matter of common experience that when a substance has been known for seventeen years under one name, the rights practically become perpetual, for neither will the public nor the profession accept the same substance under another name. The practical point at issue is that while the patent has eleven years yet to run, it in effect goes to perpetuity.

There is no other country that allows the comprehensive and iron-clad protection that the United States does. In Germany the process of manufacture is patented, but not the chemical substance, so that if an ingenious individual can devise a different method of manufacture, he can make and sell the substance under its chemical name. In the United States it matters not how ingenious any one may be, he is absolutely blocked by the patent on the chemical substance. Several years ago efforts in Congress to pass a law changing these patent grants failed, and it is stated that the failure was due to the activities of representatives of German interests.

The retail price of an ampule containing 6 decigrams of salvarsan has varied from time to time. At present it sells at $4.50. While the cost of such an ampule cannot be specifically stated, it has been estimated to be from 14 to 35 cents. A well known and thoroughly responsible man, who has had practical experience in manufacturing the drug on a fairly large scale, promises to sell it after some time (in two years) at 50 cents per dose. The foregoing estimation can be supplemented by the following: So far as we have been able to learn from the description of the patents and what has been told us by chemists, the following chemicals are used: In making salvarsan the two basic substances are anilin at 50 cents a pound, and arsenic acid at 90 cents a pound. In the process of manufacture there are used, in addition, oxalic acid at 75 cents a pound, caustic soda at 40 cents a pound, nitric acid at 21 cents a pound, sulphuric acid at 16 cents a pound, magnesium chlorid at 30 cents a pound, and sodium hydrosulphite at $3.50 a pound. The price of the last named substance is normally under 50 cents a pound. The retail price of the finished product as prepared in small doses for the customer is $3,397 a pound. In justice it must be stated that there is some fairly expensive machinery to be installed and that the services of one or two expert chemists are required (the major part of the work, however, being done by technicians). Finally, a pound is divided into 624 glass ampules containing 6 decigrams, with a nonoxidizing gas. The price of the empty ampules ranges from 2 to 5 cents. The other materials which go along with it (a small pasteboard box, tiny file and printed directions) should not cost more than a few cents. This calculation does not include certain overhead charges, cost of distribution, etc., but even when a reasonable allowance for these is included, the fact remains that on this basis the final retail price of $3,397 a pound is excessive and unjustifiable.

It is needless to mention to physicians the widespread effects, both physical and social, of syphilis or its prevalence in communities, but we venture to call attention to the following facts in order that the point in question may be emphasized:

Among 1,100 patients taken at random in a large dispensary, 11 per cent. gave a positive Wassermann reaction. In 600 inmates of a jail and penitentiary, the percentage was over 20, and in some groups it was as high as 28 per cent. In 500 patients in a hospital for the insane there were 11 per cent. positive; in another similar hospital in the same state, statistics showed 32 per cent. positive. Among 400 prostitutes, 67 per cent. had syphilis. In a large city almshouse, over 30 per cent. of its inmates were syphilitic. Among the cases in a private ward of a hospital which represents a very high class clientele, there were 5 per cent. positive. In Bellevue Hospital, 40,000 Wassermann tests were made on all the patients over a given period; the average, so we were

informed by one of the staff, was over 26 per cent. positive. Among the applicants for the army over a given period, 15 per cent. were found syphilitic. It would seem, therefore, that we are justified in estimating that there are in the United States from 6,000,000 to 8,000,000 syphilitics. We are quite aware that in the rural population the disease is not nearly so prevalent as in cities and towns, but we believe that it exists there to the extent of about 4 per cent. Recent investigations have shown that aortitis is largely syphilitic in origin; that certain conditions of the heart, particularly around the aortic valve, are syphilitic; that angina pectoris is sometimes caused by this disease; that cancer of the tongue rarely develops in a nonsyphilitic individual, and that cancer of the rectum is more often found among syphilitics than among nonsyphilitics; that aneurysm of the aorta is almost always syphilitic in origin, and that locomotor ataxia and general paresis have no other known cause. There are encouraging signs of an awakening as to the need of more adequate treatment for syphilis in hospitals and dispensaries. Several of these have already organized special departments, and others are sure to follow. Certain cities are establishing free dispensaries for syphilis and gonorrhea. The army medical officers will find a large number of syphilitics in examining recruits, and the social disruption caused by the war will greatly increase the malady.

All this goes to show the great and immediate need of a large supply of salvarsan at a price within reach of hospitals and the poor. We need it not only for the period of the war, but we may need it more after the war, because then we may have to treat this multitude of recently infected individuals.

We submit that no government should permit the patenting, and therefore the private control, of an agent which is of such great value to the welfare of its people and so strikingly needed by so many of its poor. This is an instance in which property rights are held higher than fundamental human rights; nay more, where the health and even the lives of citizens are allowed to be sacrificed rather than interfere with an alien's claim. Is it not time for Congress to adjust this matter and not allow this iniquitous condition longer to survive?

We urge, therefore, that the medical societies of the country by resolutions ask Congress permanently (not merely during the period of the war) to abrogate the patent rights on this preparation; in addition, we urge that personal letters be sent to congressmen. Three of these communications should be sent, one to the representative in Congress of the territory from which the communication is sent, one to the chairman of the committee on patents of the House, and one to the chairman of the committee on patents of the Senate. It is specifically urged that permanent adjustment be requested, and not simply a war measure.

J. M. T. FINNEY, M.D.,
GEORGE WALKER, M.D.,
Baltimore.

NIGHT CLINIC ON INDUSTRIAL MEDICINE AND SURGERY AT RUSH MEDICAL COLLEGE

To the Editor:—Rush Medical College started a course on industrial medicine and surgery at the beginning of the present year. The course is conducted by lectures and a dispensary clinic, and is held at night. Several medical schools have offered courses on occupational diseases, industrial hygiene, vocational diseases, or some other branch of industrial medicine, but this, I believe, is the first school to offer a comprehensive course covering all branches of industrial medicine and surgery. The idea is also unique of holding this clinic at night, which is certainly the logical time, for the clinic is meant primarily for the poor wage earner or for the employee of the small industry who has a large family dependent on him and who cannot get proper medical care either at home or in the industry at which he is employed.

A course on industrial medicine and surgery, to be comprehensive, must include the following branches: occupational diseases—prevention, diagnosis and treatment; supervision of health of employees, including periodic medical examination of employees, medical examination of applicants for work, prevention of disease among employees, industrial hygiene and plant sanitation; care of injured employees, which must include emergency surgery, first aid, all medicolegal aspects of the result of injury, and the surgeon's part in accident prevention work; prevention of accidents, including the "safety first" movement, cooperation between the physician and the safety engineer; and socialized medicine, including the treatment of certain diseases, the class of employees who should receive free medical care, the work of the visiting nurses among employees, and the duties of the social worker.

One of the purposes is to make a general survey of the health condition of every employee who reports to the clinic. Thus, a medical examination is made of every patient, whether he reports to the dispensary on account of some minor injury or because he has a slight cold. A general physical examination is given, and then the patient is passed on for a dental examination, a nose and throat and eye examination, into the hands of the genito-urinary department, and through the orthopedic department, in order to ascertain the condition of his feet, a very important part of the survey of a working man's condition. Through the aid of the social workers a survey is likewise made of the patient's home and working conditions. With this comprehensive survey of the physical condition of the employee, his living conditions and his working conditions, we are usually able to correct all things which are proving detrimental to that employee's health. Likewise, it gives the student a broader relationship toward his patient than he has ever had before. He obtains not only the medical aspect of the case, but also the medicosociologic aspect. It is a course designed to fit the student for this new specialty, industrial medicine and surgery.

Cooperation between the night clinic and the employers of the patients will be secured through the services of a social worker, who will visit the working places of these patients and secure such changes in work or such means of prevention as have been developed by each individual case.

Frequently such agencies as the United Charities have individuals or families applying to them for aid because of real or feigned inability to work. These individuals will be referred to the department of industrial medicine and surgery for examination and recommendation as to the expected duration of such inability, if it is found to exist, and as to the kind of work the patient may do. Here again it will devolve on the social worker either to secure employment for such patients or to cooperate with the United Charities.

One of the most important functions of this clinic will be the study and treatment of occupational diseases, and, through the social worker, securing the cooperation of employers for the prevention of such diseases.

HARRY E. MOCK, M.D., Chicago.

Child Labor on the Farm.—A *Bulletin* of the National Children's Bureau gives information of the results of the employment of children on the farms of England following regulations providing for exemption from school for this purpose. The granting or withholding of exemptions has been in most places in the hands of the local educational authorities, but their policy has not been uniform, and there has been complaint in some sections. The board of education has advised the local authorities that the employment of such labor was to be considered as an unusual measure, and that exemptions should be granted after the personal investigation of each case; that they were to see that adequate wages were offered, and that in no case should children be excused from school when children past the age of compulsory attendance were available. The authorities should secure particulars of the work, the wages offered and the period for which the labor was required; the work should be light and suitable for the child. A year after the promulgation of these regulations, a stiffening of conditions was urged, and it was required that the exemptions should be reviewed at least once in three months.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALASKA: Juneau, July 3. Sec., Dr. H. C. DeVighne, Juneau.

ARIZONA: Phoenix, July 2-3. Sec., Dr. John W. Thomas, 306 Goodrich Bldg., Phoenix.

COLORADO: Denver, July 3. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DELAWARE: Dover and Wilmington, June 19-21. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

FLORIDA, Regular: Palatka, June 19-20. Sec., Dr. E. W. Warren, Palatka.

GEORGIA: Atlanta and Augusta, May 31-June 2. Sec., Dr. C. T. Nolan, Marietta.

ILLINOIS: Chicago, June 14-16. Sec., Dr. C. St. Clair Drake, Springfield.

IOWA: Iowa City, June 7-9. Sec., Dr. G. H. Sumner, Capitol Bldg., Des Moines.

KANSAS: Topeka, June 19-21. Sec., Dr. H. A. Dykes, Lebanon.

KENTUCKY: Louisville, June 19-21. Sec., Dr. A. T. McCormack, Bowling Green.

LOUISIANA: New Orleans, June 7-9. Sec., Dr. J. A. Henderson, 921 Canal St., New Orleans.

MAINE: Augusta, July 5-6. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MARYLAND: Baltimore, June 19. Sec., Dr. J. McP. Scott, 137 W. Washington St., Hagerstown.

MICHIGAN: Ann Arbor, June 12-14. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: Minneapolis, June 5-8. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.

MISSISSIPPI: Jackson, June 19-20. Sec., Dr. W. S. Leathers, Oxford.

MISSOURI: St. Louis, June 18. Sec., Dr. J. A. B. Adcock, Jefferson City.

NEBRASKA: Lincoln, May 31-June 1. Sec., Dr. E. Arthur Carr, 516 Banker's Life Bldg., Lincoln.

NEW HAMPSHIRE: Concord, June 25-26. Sec., Dr. W. T. Crosby, Beacon Bldg., Manchester.

NEW JERSEY: Trenton, June 19-20. Sec., Dr. Alexander MacAlister, 438 East State St., Trenton.

NORTH CAROLINA: Raleigh, June 19. Sec., Dr. H. A. Royster, 423 Fayetteville St., Raleigh.

NORTH DAKOTA: Grand Forks, July 3. Sec., Dr. George M. Williamson, Grand Forks.

OHIO: Columbus, June 11-14. Sec., Dr. George H. Matson, State House, Columbus.

OREGON: Portland, June 5. Sec., Dr. Herbert S. Nichols, Corbett Bldg., Portland.

RHODE ISLAND: Providence, July 5. Sec., Dr. Gardner T. Swarts, 215 State House, Providence.

SOUTH CAROLINA: Columbia, June 12. Sec., Dr. A. Earle Boozer, 1806 Hampton St., Columbia.

TENNESSEE: Knoxville, Memphis and Nashville, June 15-16. Sec., Dr. A. B. De Loach, Scimitar Bldg., Memphis.

TEXAS: Austin, June 19-21. Sec., Dr. M. F. Bettencourt, Mart.

VIRGINIA: Richmond, June 19-22. Sec., Dr. J. W. Preston, 215 S. Jefferson St., Roanoke.

WASHINGTON: Seattle, July 3-5. Sec. Dr. C. N. Suttner, Walla Walla.

WISCONSIN: Milwaukee, June 26. Sec., Dr. J. M. Dodd, 220 E. 2nd St., Ashland.

Connecticut Homeopathic March Report

Dr. Edwin C. M. Hall, secretary of the Connecticut Homeopathic Medical Examining Board, reports the written examination held at New Haven, March 14, 1917. The total number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 2, both of whom passed. One candidate was licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
N. Y. Homeopathic Med. College and Flower Hospital		(1916)	82.5
Hahnemann Med. College and Hospital of Philadelphia		(1916)	89.9

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
N. Y. Homeopathic Med. College and Flower Hospital		(1915)	N. Jersey

Michigan Reciprocity Report

Dr. B. D. Harison, secretary of the Michigan State Board of Registration in Medicine, reports that the following candidates were licensed through reciprocity from Jan. 9 to Feb. 23, 1917:

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado		(1912)	Colorado
Chicago College of Medicine and Surgery		(1914)	Illinois
Rush Medical College		(1908)	(1915) Illinois
University of Louisville			(1915) Kentucky
University of Maryland			(1915) Maryland
University of Michigan Medical School		(1910)	Illinois
St. Louis University		(1903)	Illinois
Vanderbilt University		(1916)	Tennessee
University of Vermont		(1914)	Maine

Book Notices

A SOLDIER-DOCTOR OF OUR ARMY, JAMES P. KIMBALL, LATE COLONEL AND ASSISTANT SURGEON-GENERAL, U. S. ARMY. By Maria Brace Kimball, with an Introduction by Major-General William C. Gorgas, Surgeon-General, U. S. Army. Cloth. Price, $1.50 net. Pp. 192, with illustrations. Boston: Houghton, Mifflin Company, 1917.

This book gives us a glimpse of the army surgeon of the past, when about the only reason for the existence of an army in the United States was the Indian. Certainly the principal work of the army was to protect the early settlers of the West from these "wards of the nation," and occasionally the "wards of the nation" from the enterprising frontiersman. As General Gorgas says in his introductory letter: "The army medical officer on the plains was obliged to combine the duties of surgeon, oculist, aurist, dentist, obstetrician, general practitioner, with scanty help in nursing from the enlisted men of the Hospital Corps to whom he, himself, had taught 'first aid.' He was also general health officer of the garrison; was compelled to study and inspect water supply, to plant and irrigate post gardens, and sometimes to manufacture ice. In addition, he often had a large free clinic among Indian neighbors, traders and ranchmen." The life of an army officer, and especially of the medical officer, was not altogether delightful; it was monotonous, with plenty of hardship, occasionally some danger, and usually away from civilization and society. However, it developed healthy, courageous men —men capable of meeting all kinds of emergencies that we who live in the present "civilized" condition hardly realize. Colonel Kimball had his share of this frontier life and Indian fighting, although he lived long enough to see the end of Indian troubles and the elimination of the frontier, and to spend the later years of his life in the East. His widow, who writes this brief biography, makes it a charming story, and incidentally reveals what a different life the army surgeon of the past led as compared with the life as led by the present medical officer.

A TEXT-BOOK OF HISTOLOGY. By Frederick R. Bailey, A.M., M.D. Fifth Edition. Cloth. Price, $3.75 net. Pp. 652, with illustrations. New York: William Wood & Co., 1916.

The general plan of this book is indicated in the statement by the author that it was primarily intended to be a laboratory and class room manual for medical students. As such it is relatively short and devoted rather to a statement of the "essentials" than to a consideration of the problems and literature of the science. The chapter on the nervous system, written for recent editions by Prof. Oliver S. Strong, is more thorough in its method of treatment. This edition has been somewhat revised, and illustrations added. The revision of the text has not been sufficiently thorough to include some important recent work. This is especially true in cytology, in which new methods of cytoplasmic fixation are omitted and mitochondria dismissed with a line or two. The same criticism applies to the account of the alimentary tract and the glands associated with it, and the glands of internal secretion. The needs of the student, who finds a thorough understanding of histology the key to a thorough understanding of physiology and pathology, will require that this book be supplemented by considerable reference to the literature.

THE EDUCATION OF THE YOUNG IN SEX HYGIENE. A Text-Book for Parents and Teachers. By Robert N. Willson, M.D., Director of the Philadelphia Hospital Postgraduate Course in Internal Medicine. Cloth. Price, $2. Pp. 319, with 72 illustrations. Cincinnati: Stewart & Kidd Company, 1917.

Dr. Willson has endeavored to collect in one volume all of the available material that will be of value for parents and teachers in the education of children in sex hygiene. While much of the material is excellent, the general effect is rather confusing since the book includes scientific chapters on reproduction, educational charts, and chapters on such variant subjects as public education, venereal diseases and heredity. Much of the material is excellent, but much also is superficial.

Medicolegal

Injunction Against a "Scientific Manipulator"—Restrictions on Masseurs and Nurses

(*State Board of Medical Examiners vs. Terrill* (Utah), *161 Pac. R. 451*)

The Supreme Court of Utah affirms a decree by which the defendant was "restrained, prohibited and enjoined from diagnosing, treating, operating on, prescribing or advising for any person or persons within the state of Utah afflicted with any mental or physical ailment or afflicted with any abnormal mental or physical condition, from which person or persons he expects to or has received or does thereafter receive a pecuniary compensation, or from practicing medicine within the state of Utah, until said defendant shall have received a certificate from the board of medical examiners of the state of Utah permitting him to practice medicine within said state." The court says that it was claimed that the decree was too broad, in that it prohibited the defendant from doing merely ordinary massaging. Comparing the Utah statute with the decree, however, it will be seen that the decree but follows the language of the statute, and forbids the defendant from doing what the statute itself forbids. If the statute forbids mere massaging without a license, then also does the decree. If the statute does not, then the decree does not. However, the court thinks that mere "massaging," as that term popularly is understood, is not, within the meaning of the statute, "diagnosing, treating, operating on or prescribing or advising for any physical or mental ailment or abnormal condition of another." Thus, ordinary massaging is not within the terms of the decree, and hence the defendant is not forbidden doing that. Mere massaging is no more forbidden than mere nursing. It is easy enough for a nurse, or a masseur, to keep within his sphere and not encroach in the law by assuming or undertaking to diagnose, treat, operate on, prescribe, or advise for ailments. But the trouble with the defendant was this: To the public he held himself out as "a scientific manipulator," and as willing and ready to receive and treat patients suffering from all sorts of ailments, but when summoned into court he declared himself to be but a humble masseur, giving only massage treatments and nothing more. Let him be to the public what he claimed to be in court, and let him refrain from diagnosing, treating, prescribing and advising for ailments of others and confine himself merely to "massaging" as that term popularly is understood. Certainly one may employ a trained nurse, who, for compensation, and without a license, may accept such employment, and, without offending, may, in attendance on a patient, render such service as ordinarily is rendered by a trained nurse; but she may not diagnose, treat, prescribe or advise for ailments in the sense that one holding a certificate or license to practice medicine may do it. That also is true of a masseur. But the defendant, though merely a masseur, claimed the right to do, without a license, all that one holding a license is permitted to do. Though a mere masseur, professing no knowledge of the human system, or of diseases to which it is subject, the defendant, nevertheless, undertook and claimed the right to treat about all kinds of diseases. Without any knowledge of anatomy or surgery, he undertook to treat a broken or fractured bone of the foot; without any knowledge of pediatrics, he undertook to treat children for leakage of the heart and abdominal affections; without any knowledge of laryngology he undertook to treat tonsillitis, or throat affections; without any knowledge of anatomy, surgery, bacteriology, pathology or histology, or of other scientific subjects, he undertook to treat a boy for hip disease and patients for appendicitis and rheumatism. If a practice of that kind is to be permitted, then may we as well go back to the days when surgery was performed by the barber and the healing art administered by the Indian powwow. The object of the statute is to protect the sick and suffering and the community against the unlearned and incompetent who hold themselves out as being possessed of peculiar skill in the treatment of diseases, but who are ignorant of the human system and of the diseases to which it is subject.

Some Unusual Requirements in a Milk Ordinance Upheld

(*City of Owensboro vs. Evans* (Ky.), *189 S. W. R. 1153*)

The Court of Appeals of Kentucky reverses a judgment which dismissed the prosecution on a warrant charging the defendant with the offense of selling milk in the city of Owensboro without a permit from the food inspector and failing to have his cows examined by a veterinarian. The underlying question was as to the validity of a somewhat unusual city ordinance, which, on the whole, the court concludes was a proper exercise of the police power conferred on the city. One contention, the court says, was that the city council had no power to require the oath prescribed by the ordinance as a condition precedent to the defendant engaging in a lawful business. In order to obtain a permit to sell milk in the city, the applicant is required to make oath that he has had his entire herd of cows subjected to the tuberculin test by a graduated veterinarian approved by the city; that so many head were found to be free from tuberculosis or other disease, and that so many head reacted under the tuberculin test, which latter animals he caused to be isolated or killed. He is also required to swear that he will conduct his dairy business in accordance with the laws of Kentucky and ordinances of the city, and that he will permit any officer of the city to enter on his premises at any time to inspect his dairy and cattle, his method of handling the milk, etc., and that he will permit his dairy products to be tested at any time by the city. The court concludes that, in view of the opportunities for fraud and imposition in the sale of milk, and of the necessity of great precaution on the part of municipal authorities to secure for the people milk that is wholesome, clean, and free from disease, the preliminary oath prescribed by the ordinance is not an unreasonable requirement. Another section of the ordinance requires that the milkers must thoroughly wash and wipe their hands and the cows' udders before beginning to milk; that they shall not use pails, cans, etc., until they have been thoroughly washed with hot water and soap and afterward sterilized with boiling water or steam, and shall cover their pails, cans, etc., with sterilized absorbent cotton between two layers of sterilized gauze, through which the milking shall be done. While the method prescribed may strike the dairyman who has never been accustomed to such care, not only as being unnecessary, but also as a flagrant invasion of his right to pursue the old established method, which was accompanied by so much disease and death, the court sees nothing in the foregoing requirements that would justify a holding that the provision is unreasonable and therefore invalid. The latter part of the section is: "They must refrain from milking or handling milk in anyway when in themselves or families there is even a suspicion of any contagious of infectious disease, such as smallpox, scarlet fever, diphtheria, typhoid, tuberculosis, or the like." In the court's opinion, this provision should be given a practical construction and read as if the word "reasonable" were inserted before the word "suspicion." The purpose was not to permit the dairyman to wait until he was absolutely sure that he, or some one of his family, had a contagious or infectious disease and then spread the disease throughout the municipality, but to require him to act on such premonitory symptoms as would excite in the mind of an ordinarily prudent person a reasonable suspicion that such disease had been contracted. When so construed, the court finds nothing in the provision that is unreasonable or oppressive. Still another provision was that the milk must not contain over 300,000 bacteria per cubic centimeter, or any pathogenic bacteria of any kind. The case was before this court without any evidence tending to show that it was practically impossible for the dairyman to furnish milk of the standard required; and, since the municipality has the power to prescribe the standard of quality of the milk sold, the court cannot invade its province and hold that the standard thus prescribed is unreasonable, in the absence of clear and convincing evidence that such is the case. Nor does the court deem invalid provisions that wagons used in the delivery of milk shall be furnished with covers, shall be neat and clean, kept neatly painted, their interiors scrubbed with soap and water at least twice a week, and that no vegetables or waste products shall be hauled in them.

Society Proceedings

COMING MEETINGS

AMERICAN MEDICAL ASSOCIATION, New York, June 4-8.

American Academy of Medicine, New York, June 4-5.
American Association of Anesthetists, New York, June 2.
Am. Association Medical Milk Commissions, Brooklyn, June 1-4.
Am. Climatological and Clin. Association, Lakewood, N. J., May 29-31.
American Dermatological Association, Cincinnati, May 24-26.
American Gynecological Society, Pittsburgh, May 31-June 2.
American Laryngological Association, Atlantic City, May 28-30.
Am. Laryn., Rhin. and Otol. Society, Niagara Falls, Can., June 1-2.
Am. Medico-Psychological Association, New York, May 29-June 1.
Am. Ophthalmological Society, Virginia Hot Springs, May 29-30.
American Orthopedic Association, Pittsburgh, May 31-June 1.
American Otological Society, Atlantic City, May 29-30.
American Pediatric Society, White Sulphur Springs, May 28-30.
American Proctologic Society, New York, June 4-5.
American Radium Society, New York, June 4.
American Society of Tropical Medicine, New York, June 4-5.
American Surgical Association, Boston, May 31-June 2.
American Therapeutic Society, New York, June 1-2.
Assn. of Am. Teachers of the Diseases of Children, New York, June 4.
Conference of State & Prov. Bds. of N. Amer., Washington, May 30-31.
Idaho State Medical Association, Sandpoint, June 25-26.
Maine Medical Association, Portland, June 12-13.
Massachusetts Medical Society, Boston, June 12-13.
Montana Medical Association, Kalispell, July 11-12.
National Assn. for the Study of Epilepsy, Skillman, N. J., May 28-29.
Oregon State Medical Association, Portland, June 28-30.
Rhode Island Medical Society, Providence, May 31.
South Dakota State Medical Association, Yankton, May 28-30.
Washington State Medical Association, Spokane, June 17-19.

NEW YORK ACADEMY OF MEDICINE

Meeting held May 17, 1917

The President, DR. WALTER B. JAMES, in the Chair

This meeting was arranged in cooperation with the Public Health Committee.

Food Supply in War Time

DR. ALONZO E. TAYLOR, Professor of Physiological Chemistry, University of Pennsylvania, Associated with the Department of Agriculture, Washington, D. C.: We are urging people to produce more food, but the production of more food does not mean anything. We must produce food that actually means something in the diet of the people. We must consider the psychologic side of production, distribution and consumption. A given diet may be entirely satisfactory from the standpoint of nutrition, yet if it is of a nature to which people are not accustomed, there will be a reaction against it. Again, a diet which people pursuing the normal activities of life may tolerate, since their entire attention is not centered on food, becomes insupportable in a prison camp in which men have little to occupy their minds; the rôle of food becomes more and more important, and finally becomes an almost overwhelming consciousness.

We must bear the burden of supplying food not only for ourselves but also for the Allies. With the exception of India and Australia, the entire world is confronted with a failure of the wheat crop. Wheat has become the keystone of the diet of the civilized world; about wheat bread and milk centers the food psychology of the civilized races. The average daily consumption of wheat in grams per individual is: Austria-Hungary, 315; England, 310; France, 410; Germany, 320; Italy, 340; United Kingdom, 275; United States, 265. A failure to maintain the ordinary wheat ration was the first great mistake Germany made. The wheat ration there has been cut from 320 to 175 gm. It is highly important that the bread ration of the Allies be maintained, particularly that of France. England has learned to substitute oatmeal to a certain extent, and Italy uses large importations of maize, but France does not know how to use any substitute for wheat; the health of the French people is already greatly impaired, and it would be a great mistake to impose the use of another cereal on France. This is no time to experiment on the Allies; if an experiment must be made, the United States is in a better position to stand it.

It is essential that every person in France be provided with his full customary ration of 410 gm. of wheat daily. There are three ways in which we may stretch our wheat: by saving what is used in industries, by extracting a higher percentage of the grain in milling, or by using mixed flours. The amount of wheat used for the manufacture of alcohol for industrial purposes is insignificant, and little wheat is used in the manufacture of whisky or beer. Forbidding the use of barley in the manufacture of beer would probably result in a larger consumption of whisky. Brewers, however, have shown a remarkable ingenuity in reducing the amount of grain used in the manufacture of alcoholic beverages. Cutting down the manufacture of alcohol for industrial purposes would be a mistake. A second way of saving is by increasing the percentage of extraction in milling. In this country we extract about 72 per cent. of the whole grain for flour. The bran and middlings, the remaining 28 per cent., is utilized as food for cattle. In certain portions of the country where a substitute food for cattle is not available, a higher milling extraction would cut the milk supply as much as 18 or 20 per cent. Before taking such a step we must find a substitute food for cattle, and this may be found in the velvet and soy bean and in cottonseed; but here we have to solve the problem of transportation and of supplying these substitutes at a cost sufficiently low to permit of their being used for food for cattle. As to the third method of stretching our wheat supply, the use of mixed flours, we shall first have to have our law forbidding the sale of mixed flours abrogated. The grains that may be used in mixed flours are rice, corn, rye and barley. Rice, corn and barley cannot be used satisfactorily in proportions larger than 10 per cent., and there are many technical difficulties in the making of edible breads from these mixtures; but wheat may be mixed with 25 per cent. rye flour, and will make a bread which can scarcely be distinguished from pure wheat bread. By suspending our law and using this mixture, fully 30 per cent. of our wheat supply might be saved. A serious objection to the extraction of high percentages of whole wheat for flour is that such flours do not keep sufficiently long to permit of their sale and distribution, and hence would involve great losses from decomposition. From the point of view of price, the farmer has for his present wheat supply received $1.30 a bushel; on this basis flour should be selling for $7.25 a barrel, instead of the present price of $15.

The second great essential is the maintenance of a normal milk supply. Here Germany made her second great mistake. The German food commission fixed a maximum price on milk; the farmer found that it was more profitable to slaughter his cattle for beef, and so 1,250,000 cattle were killed and the milk ration of Germany was reduced. There is no use in trying to make anything cheap in war time, and there is no use in expecting altruism from the farmer. An allowance of about 400 c.c. of milk daily per individual is a figure that must be maintained. We are dependent on the milch cow for butter; beef cattle and swine may be slaughtered, but the milch cow must be preserved. It might be well to adapt Dr. Graham's slogan, "No housewife should buy 1 pound of beef until she has bought 3 quarts of milk." It is essential that the milk supply of France be not only maintained but that it be increased, and it is up to us to do it.

In discussing the problem of waste, I should like to speak of the economy of the French women, and I wish to urge American women to emulate their ways. In France the housewife saves even the scraps of vegetables that cannot be used; these are collected, dried, and used as food for cattle. In Germany, green vegetables that cannot be carried over to the next week are collected, dried and also fed to cattle. We must be liberal in our price to the producer. The effort to regulate the price to the buyer has been of little avail. People object to extreme control, and again we meet the racial and class psychology. If we fail to meet the problem of the food supply, we fail to fulfil our part in our world relations.

DISCUSSION

HON. JAMES W. GERARD, New York: I wish to confirm what Dr. Taylor has said of the necessity of taking into consideration the dietary customs of a people. As a protection to the food supply the card system was instituted in Ger-

many early in the war, but it did not prove very effective. For a long period ducks, geese, chickens and turkeys were not on the card, and the rich were able to obtain these until the supply was exhausted. The problem of food supply has been greatly complicated by the fact that we are feeding great numbers of people in Belgium and France, and by the action of Argentina in placing an embargo on wheat. In regard to the ration and the method of distribution and the hardships the people have undergone, in some sections the Germans seized the lands of the farmers and allowed the farmer only 10 square yards of his own land on which to raise potatoes, while the remainder was confiscated and tilled for the Germany army. To get laborers to till this land they had forcibly deported French women. When the story of Poland is written it will reveal horrors of suffering and starvation unsurpassed in the pages of human history. An attempt has been made to send food to Poland, but it was found that all was seized by the Germany army, and no agreement was reached whereby Germany would permit food to be sent into Poland. With reference to the question of a maximum price on articles of food, I feel that if it was not successful in a country like Germany where the people are disciplined to submission, it certainly would not be effective in a country like ours where the people have not learned discipline. Fixing prices will also have the deleterious effect of limiting production, so that it seems that our main attack in handling the food problem should be along the lines of preventing waste. In considering the question of diet, many have expressed the fear that the restrictions suggested will have the effect of producing tuberculosis. In Germany there has been no material increase in tuberculosis; on the other hand, there was a great increase of tuberculosis in France. One reason for this is that workers in all lines of social service work are needed in France. There has been no material increase in the infant death rate in Germany during the war, and this is because of the great number of social workers who are going about teaching people not only how to feed infants but also how to keep house. This is not done to the same extent in France; there is not a health department in any French city as efficient as ours. In considering the problem of waste, it seems that in this country the credit system and the use of the telephone were largely responsible for the high prices. The people here will not resort to a central market or carry a market basket.

GRAHAM LUSK, New York: Today the men of England, Germany and other warring nations are tightening their belts. This does not mean that they are dying of starvation. Magnus Levy has shown that a man may lose 30 per cent. of his weight and reduce his intake of food 44 per cent. and still survive. I myself know of a woman whose weight was reduced from 136 to 71 pounds and she was taking but 40 per cent. of the food she originally took and was getting on fairly well. These persons were at rest. Reasoned coldly from such facts as these it might be said that we may starve our women, our children and our old people and one may even starve himself, but the man doing work requires an extra amount of food. According to the statistics of life insurance companies, a loss of 10 pounds from the average weight of a man 55 years of aged would result in an increase of his value as a life insurance risk. Furthermore, the loss of that 10 pounds would mean that it would require less food to furnish energy to support and propel him than when he is carrying excessive weight. The man doing work needs food fuel. Meat is needed only for repair, and we could get along very well on half the amount we are now eating. We could destroy the cattle not needed for milk and we could put roast beef in the same category with canvas-back duck and serve it with champagne without serious consequences, but we must maintain our milk supply. We have taken our men from the farms and put them into munition factories and shipyards, and we are having them do the "goose-step"; it is calculated that for the latter purpose it requires 4,000 calories a day for each man. Now, how are we to produce this absolutely necessary fuel food? The farmer has no guarantee that he will be able to get men to help him harvest his crop, or that he will get a fair price for his produce. We must give bounties to men to go on the farms. Food fuel is the basis of everything. We need it for the human machines not only in this country but also in England and France. To produce this food, all political chicanery and the united power of an intelligent people are required, two things almost impossible to get in this country. The question is whether we are competent to perform the task of feeding the world or whether we are going to be; the successful accomplishment of this task is the only factor that will save the world in the present situation.

C.-E. A. WINSLOW, New Haven, Conn.: War has always brought in its train pestilence and famine. Pestilence seems to have been quite effectually controlled in the present war; famine is the problem now confronting us. A popular writer has recently said that the United States is facing a food stringency such as it has not experienced since the first winter at Plymouth. The shortage of food may be met in two ways, either by increasing the production, or also in part in the way that the problem of pestilence has been solved, by scientific advances. As an illustration, a large baking firm found that it was operating more successfully in one city than in another. Investigation showed that in the two cities the same yeast and same flour were being used; the only difference was in the water. The water used in the city that was showing the more successful results was rich in certain mineral salts, and the use of that water saved half the value of the yeast and 2 per cent. of the flour. Much may be done by the intelligent selection of foods and the avoidance of waste, but in the application of this advice we have the psychologic factor with which to contend. Oleomargarin is a perfectly satisfactory substitute for butter, but it is difficult to overcome the prejudices of people and get them to use it. We have also on our coasts an unused fish supply. The problem we have before us is to change the habits of the people, and here we can draw a lesson from that other campaign against disease. Having obtained the scientific knowledge, the problem is how to apply it. The same kind of a systematic campaign of education that has been carried on against disease must be instituted in order to carry the knowledge we have of foods into the homes. The machinery for this systematic education we already have in our health department, nursing forces, and visiting housekeepers. If we adopt such a system of education we shall reap a rich benefit; not only during the war but also in the more distant future. We at Yale have particularly felt the reality of war as we have seen our boys go to the front. We have seen the careless boy with his college shuffle leave the moving picture shows and the cafés, and in a brief space of time become a well-knit man, serious in mind and demeanor. Our whole country must go through the same experience; it too must learn what discipline means. We must learn to forego doing things simply because we like to do them, and learn the lesson of cooperation for the good of our fellows. This is the lesson that we as a nation must learn if we are going to grow up and "do our bit" in the struggle before us.

DR. HAVEN EMERSON, New York: The health department has made some small contributions to the solution of the food problem. A year ago, when we passed the ordinance permitting the use of horse flesh as food, we made it possible for many of the poor of New York to keep the soup-pot boiling during the past winter who otherwise could not have done so. We have been instrumental in having legislation passed that permits the sale of skimmed milk in this city. This milk is as free from bacteria and other impurities as any of the other grades of milk sold in this city. A matter that calls for correction is the loss of food through lack of proper facilities for transportation. Trainloads of fruits, vegetables and nuts arrive here unfit for human consumption. Provision should be made for drying such foods and using them for food for cattle. The Barren Island garbage incineration plant, which formerly ran all day and often far into the night, now usually completes its work by 3 p. m. There is a reduction of 25 per cent. in the amount of garbage handled by the garbage plant. Kitchens have been attached to the milk stations where instruction in home economics and the use of substitute foods will be given. The tuberculosis clinics

and other clinics and health department offices are being employed as education centers to teach food economy. These are the contributions the health department is making in order that we may be generous and not stingy with our national food supply.

AMERICAN ASSOCIATION OF IMMUNOLOGISTS

Fourth Annual Meeting, held at New York, April 6-7, 1917

(*Continued from page 1504*)

Studies on the Isolation of Streptococci from Rabbits

DR. E. T. TSEN: In investigating the relation of streptococci to poliomyelitis, we made cultures of the brains of twenty-three out of fifty-four rabbits studied. Five of these were inoculated with glycerinized poliomyelitis virus from monkeys; one was inoculated with brain emulsion of a rabbit that died after an inoculation with poliomyelitis virus; two were inoculated with streptococci from monkeys; two were inoculated with streptococci from rabbits that died after inoculations with poliomyelitis virus; one was inoculated with streptococci from a rabbit that died after an inoculation with streptococci; two were syphilitic, and nine were normal. From the brains of all that were inoculated with poliomyelitis virus, streptococci or *Spirochaeta pallida*, we have isolated streptococci and, sometimes, other gram-positive diplococci. Of the nine normal rabbits, we got the same organisms from the brains of six. Rosenow's culture methods were used. It was proved that in healthy, normal individuals, streptococci were sometimes found, and it was potentially, not actually, sterile. Streptococci had not been found in the brain of such because they had not been looked for. In tubes grown from sick rabbits, however, organisms were often present in all the tubes, while in the normal rabbits, a growth occurred in one or two out of sixteen tubes. Flexner and Noguchi, and Rosenow found these organisms, but interpreted the findings differently; Rosenow regarded them as specific causative agents in many diseases. Flexner and Noguchi regarded them as contaminations. Our interpretation differs from both. We regard these organisms as saprophytes, which, under lowered conditions of resistance, acquire power to invade the tissues extensively.

DISCUSSION

DR. J. A. KOLMER, Philadelphia: In the recent epidemic of poliomyelitis in Philadelphia, Drs. Freese, Brown and myself found streptococci and diplococci widely dessimated in the tissues after death—in the brain and cord, and also in the internal organs. They probably are of a low grade of virulence, and occur symbiotically with the true microparasite; they also play a certain rôle in the pathogenesis of poliomyelitis, as streptococci do in scarlet fever.

DR. HANS ZINSSER, New York: I should like to support Dr. Tsen's remarks. I do not think that he meant to say that these organisms are purely saprophytic, but that they are not the etiologic factor in the disease. They probably invade the tissues of a sick animal more readily than they do those of a healthy one. Whether or not they cause symptoms, I am unable to say.

Further Observations on Local Resistance to Syphilis in Reinoculated Rabbits

DRS. HANS ZINSSER, J. G. HOPKINS and M. MCBURNEY, New York: In our first series of seventeen reinoculated rabbits, some doubtful nodules were felt, and in three cases spirochetes could be demonstrated by puncture. One rabbit developed frank lesions containing active spirochetes, and reinoculation was performed less than two weeks after the healing of the original lesion. In the other animals the interval was from three weeks to one year. They were inoculated and reinoculated in groups of three or four, and normal rabbits were inoculated at the same time as controls. The same material was used and the controls were proved positive by puncture. Many other normal rabbits were inoculated at the same time. Lesions were present in 100 per cent. In reinoculation, the second lesion differed in type and site from the first. Successful reinoculation seemed to prove that the resistance was purely local. In further experiments, one testicle was inoculated and the normal testicle was used for control. In two rabbits, inoculated in one testicle and reinoculated in both, local resistance to infection seemed to have developed on both sides. Only lesions showing numerous active spirochetes were used for inoculation.

DISCUSSION

DR. RICHARD WEIL, New York: It seems to be a remarkable phenomenon if it indicates a localized specific immunity. I do not question the occurrence of this phenomenon; it is in keeping with what we know of localized immunity in variola, for example. Again, in making repeated serum injections one sometimes finds that the sites which had recieved the earlier injection are the ones which light up when subsequent injections are made at a distance. This seems to show excess of antibody at the site of original infection.

DR. HANS ZINSSER, New York: This was the first evidence we had of traceable immunity in rabbits. You can reinoculate rabbits on the opposite side and get a positive result. We were unable to demonstrate any antibodies against spirochetes in the serum of the syphilitic animals or human beings. Culture spirochetes are antigenically quite different organisms, and have nothing in common with virulent spirochetes, which seem to be entirely unsusceptible to serum effects. Syphilitic serum does agglutinate culture spirochetes slightly, but there is not enough difference between normal and sypilitic serum in this respect to warrant diagnostic use of the reaction. The absence of circulating antibodies in syphilitic individuals renders our discovery of a purely localized resistance all the more interesting. Kraus' work with variola was along similar lines. He found that the skin as a whole became immune. We do not assert that this is resistance in an active sense, but merely that there is no visible lesion. It may be an *Allergie* and the tissues no longer react to invasion. Spirochetes may pass through without rousing a reaction, as suggested by Neisser. There is an inability to react on the part of cells which have once reacted directly to the virus.

Desensitization of Guinea-Pigs Sensitized to Dog's Serum

DR. A. F. COCA, New York: One of the most constant characteristics of the anaphylactic state is the phenomenon of desensitization which may generally be produced in sensitized animals by the intravenous injection of sublethal doses of the respective antigen, or by intraperitoneal or subcutaneous injection of multiples of the intravenous lethal dose. I have deduced the following conclusions: 1. Guinea-pigs, actively sensitized to dog's serum, cannot be desensitized by (*a*) subcutaneous injections of large amounts (fifteen lethal doses) of the dog's serum, (*b*) intraperitoneal injections of one-third a lethal dose, or (*c*) the intravenous injection of one-half a lethal dose of the dog's serum. 2. The desensitization, however, can be accomplished by slow intravenous injection (fifteen minutes) of two lethal doses diluted to 2 c.c. with physiologic sodium chlorid solution.

DISCUSSION

DR. HANS ZINSSER, New York: Is there any difference between this and the method of Friedberger of slow injection for the avoidance of anaphylactic shock?

DR. A. F. COCA, New York: The method I employed for producing the desensitization is not original. It was described by Friedberger. I am merely pointing out that it is the only available method of desensitizing guinea-pigs that have been actively sensitized to dog's serum.

Studies on Reducing Action by Bacteria

DR. B. ARANOWITZ: The following points can be noted: The reducing enzyme is not secreted by the cell. The action of the enzyme is independent of the life of the cell. It is destroyed in from fifteen to thirty minutes at 60 C. It is held back by the Berkefeld filter. Chemicals, as saponin and sodium taurocholate, do not accelerate secretion of the enzyme, though making the cell membrane more transfusible. Grinding, freezing with thawing, and elimination of bacterial remnants do not isolate the enzyme. Autolytic processes and

digestion in 2 per cent. trypsin emulsion in 0.05 sodium carbonate solution does not release the enzyme from the cell protoplasm. Bacteriolytic action of immune serum and complement prove of value in separating enzyme from cell body. Proteins of the medium are not necessary for reducing activities of bacteria.

DRS. W. H. MANWARING, Sanford University, California, Y. KUSAMA and A. R. MEINHARD: Our analyses of the anaphylactic and immune reactions by means of perfusion experiments with isolated rabbit and guinea-pig tissues have shown that the hypersensitive and immune, humoral and cellular factors may coexist in the bodies of anaphylactic and immune animals in the following conditions: cellular anaphylaxis and approximately normal blood conditions; cellular anaphylaxis and humoral anaphylaxis; cellular anaphylaxis and humoral immunity; cellular immunity and humoral anaphylaxis; cellular immunity and humoral immunity, and cellular anaphylaxis and cellular immunity. It will probably be necessary to reduce anaphylatic and immune reactions to lower physiologic terms than those at present employed, before hoping to harmonize these observations with current serologic theories.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

May, XIII, No. 5

1 Nonprotein Nitrogen of Blood in Atrophic Infants. L. D. Minsk and L. W. Sauer, Chicago.—p. 397.
2 Nitrogen Partition in Urine of Normal Children. M. R. Johnston and B. S. Veeder, St. Louis.—p. 404.
3 Gestation vs. Stage of Lactation as Factors Causing Abnormal Composition of Cow's Milk. L. S. Palmer and C. H. Eckles, Columbia, Mo.—p. 413.
4 *Bacteriology of Urine in Children with Vulvovaginitis; Report of Two Cases of Gonococcus Cystitis. A. B. Schwartz, Milwaukee, Wis.—p. 420.
5 Case of Congenital Endocarditis. H. E. Tuley and J. W. Moore, Louisville, Ky.—p. 426.

4. **Bacteriology of Urine in Gonococcus Vulvovaginitis.**—In eighteen unselected patients with chronic gonococcus vulvovaginitis, carefully catheterized specimens of urine showed a comparative absence of bacteria. The majority of the organisms encountered were either gram-positive cocci or diphtheriod bacilli. In most instances these were in such small numbers that they could easily be accidental contaminations from the urethra. The second portion of the urine, representing the bladder flora, was shown to be as free from infecting organisms as was demonstrated in a previous series of normals. The occurrence of vulvovaginitis did not increase the tendency to contamination of the bladder. According to Schwartz gonococcus cystitis may follow previous infections of the bladder by *Bacillus coli* in patients with vulvovaginitis.

American Journal of Medical Sciences, Philadelphia

April, CLIII, No. 4

6 *Disturbance of Law of Contrary Innervation as Pathogenetic Factor in Diseases of Bile Ducts and Gallbladder. S. J. Meltzer, New York.—p. 469.
7 *Diagnosis of Gallbladder Disease. W. F. Cheney, San Francisco.—p. 477.
8 Medical Aspects and Diagnosis of Gallbladder Disease. D. Riesman, Philadelphia.—p. 492.
9 *Gallbladder Disease; Progressive Inflammation; Its Treatment; Cholecystectomy. R. S. Fowler, Brooklyn.—p. 497.
10 Pericardiotomy for Suppurative Pericarditis Following Pneumonia; Report of Case and Review of Literature. C. N. B. Camac and E. H. Pool, New York.—p. 509.
11 *Acute Pericarditis. W. H. Robey, Jr., Boston.—p. 529.
12 Nonsurgical Treatment of Gastric Ulcer. F. Smithies, Chicago.—p. 547.
13 *Operative Treatment of Hydrocephalus; Preliminary Report of Forty-One Patients. W. Sharpe, New York.—p. 563.
14 *Effect of Nuclein Injection on Leukocytes of Dogs. H. Fox and F. B. Lynch, Philadelphia.—p. 571.
15 *Limits of Bleeding Considered from Clinical Standpoint. B. M. Bernheim, Baltimore.—p. 575.
16 Main Factors Affecting Intensity of Sounds as They Pass from Interior of Lungs to Periphery of Chest. C. M. Montgomery, Philadelphia.—p. 583.

6. **Diseases of Bile Ducts and Gallbladder.**—Meltzer states that the law of contrary innervation is manifest in all functions of the animal body, and he believes that a disturbance of this law is a factor of more or less importance in the pathogenesis of many disorders and diseases of the animal body. The gallbladder, for instance, is well provided with muscle fibers, the contraction of which will free the gallbladder from its fluid contents. Oddi described some thirty years ago that the papilla of Vater is provided with circular muscle fibers which by their contraction close up the common duct. This contraction is strong enough to resist a pressure much higher than that which usually obtains in the bile ducts. It is clear that the muscle fibers of the gallbladder and those of the papilla are antagonists. During the storage of bile the muscle fibers in the papilla are contracted and those of the gallbladder are inhibited; during the discharge the gallbladder contracts and Oddi's muscle is relaxed; the bile has then no other way out but into the duodenum. Stimulation of the peripheral end of the splanchnic nerves causes simultaneously a contraction of the gallbladder and an inhibition of the tonus of Oddi's muscle. The vagus, on the other hand, seems to contain motor fibers for the sphincter of the common duct and inhibitory nerve fibers for the gallbladder. The physiologic discontinuous character of the flow of bile into the duodenum is regulated by a reflex mechanism, dominated by the law of contrary innervation; the integrity of the gallbladder is an important part in this reflex mechanism; the discharge of bile can be greatly curtailed by the absence or a restriction of the discharge of chyme from the stomach into the duodenum, and the discharge of bile through the papilla of Vater into the duodenum is greatly enhanced by the presence in the lumen of the latter of peptone or albumosis.

The physiologic storage of bile may be converted into a pathologic stasis and thus become the cause of a more or less serious ailment of some part of the biliary system. Psychical influences and the influences of the partaking of food and of the character of the food which is partaken may prove to be pathogenetic factors in the formation of biliary diseases. Simple infrequent feedings, say the partaking of only one meal or even two meals a day, may very gradually finally lead to pathologic consequences. The accumulation of the bile in the gallbladder and in the ducts for longer periods, and the continued repetition of these periods may gradually reduce the normal resisting power of the corresponding mucous membranes which may become a serious pathogenetic factor, in case the individual has passed or is passing through an infectious disease. Even in health it is advisable to partake of comparatively frequent meals, although they need not consist of large quantities and the meal contain foods which readily send peptone and albumoses into the duodenum.

7. **Diagnosis of Gallbladder Disease.**—Painstaking efforts in eliciting an orderly and complete history not only of the patient's complaint but of all other incidents in the previous health; careful and intelligent use of the eyes, the finger tips, and the ears in acquiring information about the patient; and good judgment in sifting and interpreting the facts so obtained, Cheney claims, are still the methods that surpass all others in diagnosis. The newer laboratory and Roentgen-ray aids are exceedingly valuable and never to be overlooked, but not to be relied on as short cuts and labor saving devices to supersede the other means described, as seems to be too much the tendency in this day.

9. **Treatment of Gallbladder Disease.**—Fowler believes that it is logical to assume that cholecystectomy is indicated in all diseases of the gallbladder whether causing mild or severe symptoms. The operation is not done for the purpose of removing stones, for these may or may not be present, but for the purpose of removing tissue diseased as a result of progressive inflammation. Just as soon as this inflammation has reached a point where the efficiency of the gallbladder is impaired and symptoms result, just so soon should the gallbladder be removed. Whether gallstones are present or not is immaterial.

11. **Acute Pericarditis.**—This paper is based on a study of the protocols of eighty proved cases of acute pericarditis and the literature particularly of the last five years. Robey regards acute pericarditis as a secondary affection. Several other lesions were found in every case in the seventy-eight necropsies. The extension from adjacent structures is probably uncommon, the vast majority of cases occurring from infection of the sac through the blood stream. Pain in the precordial area is not as common as is supposed. The difficulty in diagnosis is illustrated by the fact that acute pericarditis was recognized clinically only 100 times in 34,567 cases and twelve times in seventy-eight necropsies at the Boston City Hospital. Pneumonia is the chief agent in the production of purulent and of fatal pericarditis. Rheumatism may cause a greater number of cases of all types, but the figures are open to doubt. Pneumococcus pericarditis or myocarditis, or both, should be considered, especially in young or middle-aged adults, when the heart shows failure of compensation before the crisis or after it when there is fever and delayed convalescence. The prognosis in acute pericarditis following acute arthritis is generally favorable to life; the extent of damage to the subsequent function of the heart cannot be determined, of course, immediately. In the clinical protocols of this series, acute arthritis was not found once. Pneumococcus pericarditis is grave at any stage. Tuberculous pericarditis is not common, and is usually a late involvement in an advanced case. In mild cases of fibrinous pericarditis or of moderate effusion, especially when an accompaniment of acute arthritis, treatment of the infection and local applications to the precordia will often suffice. When the progress is unsatisfactory, the physical signs increasing, and the diagnosis doubtful, paracentesis is imperative. Frequent examinations during the infection and for some time after are very important. A thorough search for and the eradication of foci should be conducted in every case.

13. **Operative Treatment of Hydrocephalus.**—The object of the operation done by Sharpe has been to drain permanently the ventricles (in the internal type of hydrocephalus) and the subarachnoid and subdural spaces (in the external type of hydrocephalus) outward beyond the cerebrospinal canal, that is, beyond the dura into the subcutaneous tissues of the scalp. Six linen strands are inserted into the ventricles in the internal type and merely into the subarachnoid and subdural spaces in the external type of hydrocephalus and their ends brought out through the temporal muscle and temporal fascia beneath the scalp in a stellate manner. In this series of forty-one operated patients, thirteen died, all of them, with the exception of one child, within thirty-six hours after the operation; that is, they could not survive the operative shock due to the sudden loss of a large amount of cerebrospinal fluid (this loss is now controlled and greatly lessened by elevating the head of the patient at the time of the ventricular opening). Of the remaining twenty-eight patients the results have been most encouraging. With the exception of six all of them have improved and are still improving; five of them have improved mentally and physically in every way, all of these children having been operated within one year after birth; seven of the patients unable to walk before the operation are now walking although with difficulty. The different stages of papilledema and choking of the optic disks producing a secondary optic atrophy and the visual impairment in these patients have been improved in each case unless a complete secondary optic atrophy had already occurred.

14. **Effects of Nuclein Injection on Leukocytes.**—Tentative conclusions drawn by Fox and Lynch from their work on dogs are that after nuclein injection there is a reduction in the circulating peripheral leukocytes, chiefly of the polymorphonuclears, and to a much less degree of the small lymphocytes, followed by a rise in both, but very largely of the polynuclears, even to 95 per cent. of the whole count. The total leukocyte count in dogs may be increased 200 per cent. in twenty-four hours. Repeated small doses of nuclein do not cause and maintain a high tide of leukocytosis. There seems to be destruction of polynuclears because of their great decrease, and the relative and absolute increase of young forms on the left side of Arneth's formula. The appearance of these young forms, and of an increase in nucleated reds, speak for an increased activity of the bone marrow, therefore, a stimulation of the tissue, but whether by the nuclein injected, as a response to the paucity of circulating white cells, or by excitation by the detritus of destroyed leukocytes the authors have not yet determined.

15. **Limits of Bleeding.**—In cases of severe hemorrhage—it matters not what the cause, Bernheim says, a good working rule is to transfuse if the blood pressure falls as low as 70 mm. of mercury, since life is hardly possible with anything below this level. But even in these cases the rule must be somewhat elastic because one can never tell when the pressure is going to rise. In some instances if the physician or surgeon in charge of the case has not taken the steps usual in emergency cases, such as salt infusions, etc., it may be wise to delay until these can be instituted, preparations for transfusion being made in the interval. If no appreciable results occur within one hour the case is usually hopeless unless new blood is introduced, and procrastination at this stage of the game is fearfully dangerous. The blood picture itself is of little avail in severe accidental hemorrhage. Measures to stop the bleeding should be instituted immediately, and the body should be kept as warm as possible, the foot of the bed elevated, the limbs bandaged, the patient kept quiet, and water given *ad libitum*. If the bleeding has not been too great, a few hundred cubic centimeters of salt solution are all that is needed to tide a patient over. In cases of very severe hemorrhage the amount might be increased a bit, but if 1,200 c.c. do not steady a falling blood presssure or cause a slight rise, its introduction had better be discontinued. Bernheim urges that transfusion be not regarded entirely as a measure of last resort. In the acute hemorrhages, the safest guide is the blood pressure; in the chronic bleedings and the anemias it is the hemoglobin; but one must never lose sight of the fact that at times all signs fail, and there remains naught for guidance but experience and judgment. Under these circumstances Bernheim's advice is, "When in doubt, transfuse!"

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

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17 Cancer of Cervix; Cautery Amputation. R. L. Dickinson, Brooklyn.—p. 737.

18 Case of Fetus Amorphus Anideus, from Department of Obstetrics and Gynecology, Yale Medical School. J. M. Slemons, New Haven, Conn.—p. 749.

19 Fifteen Years' Experience with Intermediate Repair of Injuries of Childbirth. B. C. Hirst, Philadelphia.—p. 752.

20 Surgical Traumatism as Cause of Recurrence in Uterine Carcinoma. G. E. Shoemaker, Philadelphia.—p. 758.

21 Treatment of Eclampsia with Especial Reference to Vaginal and Abdominal Section. G. L. Brodhead, New York.—p. 762.

22 Management of Eclampsia. A. B. Spalding, San Francisco.—p. 773.

23 Case of Postpartum Eclampsia with Necropsy. R. A. Keilty and S. P. Taylor, Philadelphia.—p. 779.

24 Indications and Contraindications for Cesarean Section. W. T. Getman, Buffalo.—p. 781.

25 Gonorrhea Sociologically Considered. M. Rabinovitz, New York.—p. 791.

26 Review of Three Hundred Obstetric Cases in Private Practice. G. B. Miller, Washington, D. C.—p. 798.

27 Case of Separation of Pubic Symphysis in Forceps Delivery and Treatment Employed. J. M. Allen, St. Johnsbury, Vt.—p. 808.

American Journal of Roentgenology, New York

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28 *Carcinoma of Uterus Treated by Combination of Radium and Roentgen Rays. R. H. Boggs, Pittsburgh.—p. 207.

29 *Roentgenotherapy of Hopeless Malignancy. G. C. Johnston, Pittsburgh.—p. 210.

30 *Blood in Cancer Under Roentgenotherapy. R. H. Stevens, Detroit.—p. 215.

31 Possible Roentgen Sign in Certain Types of Mesenteric Cysts. C. F. Ball, Rutland, Vt.—p. 250.

28 and 29. Abstracted in THE JOURNAL, Nov. 18, 1916, p. 1549.

30. Abstracted in THE JOURNAL, Nov. 18, 1916, p. 1548.

Archives of Pediatrics, New York

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32 Measles from Standpoint of Prevention. J. G. Wilson, Ellis Island.—p. 241.

33 Pellagra in Children. W. A. Murphy, New York.—p. 254.

34 Analysis of Preparalytic Symptoms of Infantile Paralysis. J. A. Colliver, Los Angeles.—p. 263.
35 Cardiac Diseases in Children and Cardiac Clinic. J. S. Ferguson, New York.—p. 269.
36 *Perlèche; Its Bacteriology, Symptoms and Treatment in Two Hundred and Twenty-Three Cases. A. L. Smith, Lincoln, Nebr. —p. 274.

36. **Perlèche.**—Perlèche is an infection of the labial commissures, manifesting itself, first, by a maceration of the epithelium, second, by a desquamation of this tissue, and third, by a formation of shallow ulcers and cracks. It is contagious and is essentially a disease of childhood, 93 per cent. of the cases reported by Smith being in children. Of the 1,211 children he has examined 207 were infected with perlèche in some stage of its development. It was found sixteen times in adults, and of this number seven were dispensary assistants who were intimately in contact with the disease. The anaerobic streptococcus was found in pure culture in 135 cases. Twenty-six times the same organism was found in combination with the *Staphylococcus pyogenes-aureus;* seven times with the *Staphylococcus albus* and fourteen times in association with the *Streptococcus pyogenes.* In the later stages of the disease, the anaerobic streptococcus was not found at all, but the *Staphylococcus pyogenes-aureus* was found alone thirty-six times and was associated three times with the *Streptococcus hemolyticus.* Thus, it seems, the anaerobic streptococcus disappears after the secondary infection.

The following treatment has given the best results: The home surroundings must be rendered as sanitary as possible. The abnormal conditions about the mouth must be corrected so that the hypersecretion of the salivary fluids may be overcome. After this the local condition can be treated successfully. Paint the lesions with a 50 per cent. solution of silver nitrate (care being taken not to have too much on the applicator) and when dry apply Lassar's zinc oxid paste. If the lesions do not disappear in a few days, spirits of camphor or alcohol are applied. If the flow of saliva has not decreased in amount, tincture of belladonna should be given internally until the physiologic limit is reached. In four of the patients the lesions did not disappear after seven months of treatment by local applications, but when belladonna was given until the salivary secretions were reduced in amount, they soon healed. When pus infections are present the crusts should be soaked with a 1:1,000 solution of mercuric chlorid, then removed and the area covered with 5 per cent. ammoniated mercury ointment.

Boston Medical and Surgical Journal

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37 Clinical Observations on Three Hundred and Thirty-One Cases Presenting Symptoms of Nephrolithiasis. R. F. O'Neill, Boston. —p. 623.
38 Infection of Simple Closed Fractures. J. B. Blake, Boston.—p. 628.
39 Some Recent Experiences in Gastric and Duodenal Surgery. J. T. Bottomley, Boston.—p. 629.
40 Gastrojejunostomy Under Local Anesthesia in Two-Stage Operation in Gastric Surgery. D. Cheever, Boston.—p. 633.
41 New Bone Wiring Instruments. J. Duff, Jr., Charlestown.—p. 636.
42 *Report of Harvard Infantile Paralysis Commission for 1916. F. W. Peabody, Boston.—p. 636.
43 Eskimo "Deficiency Disease." J. M. Little, Jr., St. Anthony, Newfoundland.—p. 642.

42. **Acute Infantile Paralysis.**—The total number of cases visited by the physicians of the commission was 187. Of these the diagnosis of poliomyelitis was made in 123 and the remaining 64 were cases of other diseases. Of the 123 cases of poliomyelitis seen, 54 were first visited in the preparalytic stage, 65 were recently paralyzed cases, and 4 were cases of old paralysis. Of the total of 54 preparalytic cases seen, 51 were treated with immune serum; 35, or 69 per cent., recovered without paralysis; 11, or 21 per cent., recovered with paralysis, and 5, or 10 per cent., died. In the 11 paralyzed cases the results were slight in 6. Of the 69 paralyzed cases, 60 were treated with immune serum; 8, or 12 per cent., showed definite rapid improvement, 33, or 51 per cent., did not; 21, or 32 per cent., died. In the total of 123 cases there were 26 deaths, a mortality of 21 per cent. The amount of serum administered intraspinally was usually about 10 cm. at one injection. Only rarely was more than 15 cm. given, because the effect of raising the pressure in the spinal canal was feared. Only one treatment was given in 27 of the 51 preparalytic cases, while 16 received two treatments, 6 received three, and 2 received four treatments. Injections were usually given at intervals of twelve to twenty-four hours and whether or not treatment was repeated depended on the clinical picture. The work on the diagnosis of poliomyelitis with the aid of the examination of the spinal fluid has been of considerable importance. In all early cases the examination of the spinal fluid has shown evidence of a meningitis and the cell count has ranged from 34 to 1,980 per cubic centimeter in the preparalytic stage.

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44 Differentiation of Abdominal Pain. J. B. Deaver, Philadelphia. —p. 147.

Illinois Medical Journal, Chicago

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45 Postoperative Volvulus. C. A. Buswell, Chicago.—p. 291.
46 Postoperative Sequelae and Their Avoidance. G. de Tarnowsky, Chicago.—p. 293.
47 Local Anesthesia. F. G. Dyas, Chicago.—p. 295.
48 Orthopedic Treatment of Poliomyelitis Anterior. E. W. Ryerson, Chicago.—p. 299.
49 Medical Aspect of Acute Poliomyelitis. F. D. Francis, Chicago.—p. 301.
50 Indications for Decompression. W. H. Perry, Sterling.—p. 309.
51 Foci of Infection About Teeth. W. T. Clark, Fort Atkinson, Wis.—p. 312.
52 Clinical Aspect of Cardiac Incompetence. G. Richter, St. Louis. —p. 315.
53 Home Talent. G. K. Wilson, Streator.—p. 320.
54 Functions and Problems of Medical School Inspector. D. W. Day, Rockford.—p. 322.
55 Use of Massage and Exercises in Treatment of Flat-Foot. H. A. Oldenborg, Chicago.—p. 324.
56 Two Cases of Amaurotic Family Idiocy. (Tay's-Sachs' Disease.) E. F. Leonard, Chicago.—p. 327.
57 Treatment of Tabetic Ataxia by Reeducational Exercises. L. J. Pollock, Chicago.—p. 331.
58 Modern Hospital for Insane from Standpoint of Medical Service. H. D. Singer, Kankakee.—p. 334.
59 Case of Recurrent Streptococcus Viridans Endocarditis with Unusual Meningeal Complication. W. H. Nadler, Chicago and R. F. Herndon, Springfield.—p. 339.
60 Crippled Child. F. C. Test, Chicago.—p. 340.

Journal-Lancet, Minneapolis

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61 Cardiovascular Syphilis. C. L. Greene, St. Paul.—p. 289.
62 Military Preparedness. J. S. White, St. Paul.—p. 297.
63 Experiences of Allen Treatment. C. P. Robbins, Winona.—p. 300.
64 *Secondary Anemias of Doubtful Causation. T. R. Martin, Duluth. —p. 303.
65 Mastoiditis; Its Prevention Operative Indications and Operative Technic. F. C. Todd, Minneapolis.—p. 307.

64. **Secondary Anemias of Doubtful Causation.**—An analysis is presented by Martin of forty cases of profound anemia in which the symptoms did not give a clue to the causation. Eleven cases are classified under pernicious anemia, the diagnosis in seven of them being alone on the clinical course of the disease and the blood picture. In four cases this diagnosis was substantiated by examination of the duodenal contents according to the Schneider method. Eight of these patients have had the spleen removed. Five made a rapid recovery, and approximated a normal blood count within a period of about six weeks. Four of these five have since relapsed. One has maintained a better state of health than he had prior to the operation, but presents the static results of the cord lesion which partially incapacitates him. There is one death in this series following operation, due to a postoperative pneumonia. Two patients have shown little change in the blood picture, although general conditions improved somewhat. The duodenal contents were not examined in either of these two cases, and Martin concludes that they were presumably unfavorable cases for splenectomy. Twenty-five cases have been classified as secondary anemias.

Four were bleeders from the gastro-intestinal tract, two being malignant, and none giving gastro-intestinal symptoms. Three cases giving a blood picture of pernicious anemia showed segments of the dibothriocephalus in the stool. In two cases a diagnosis of probable pernicious anemia was

made from the history and the blood picture, the examination of the gastro-intestinal tract being negative. The duodenal contents in both cases did not show a pleiochromia. One of these patients has since died in the fourth relapse. In two cases, with negative urine findings, the diagnosis of chronic interstitial nephritis was made on the blood pressures and the phenolphthalein output. In three cases a careful examination did not reveal causation of the anemia. Eleven of the twenty-five patients showed repeatedly a 4 plus Wassermann reaction, and careful examination did not reveal any other cause for the anemia. The anemia was not of the splenic type; the spleen was not enlarged. Most of these patients showed rather normal looking red blood cells and the hemoglobin usually a strong one index.

Journal of Experimental Medicine, Baltimore

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66 *Experiments on Rôle of Lymphoid Tissue in Resistance to Experimental Tuberculosis in Mice. Effect of Cancer Immunity on Resistance to Tuberculosis. H. D. Taylor and J. B. Murphy, New York.—p. 609.

67 *Transplantation of Spleen Tissue into Subcutaneous Fascia of Abdomen in Rabbits. O. T. Manley and D. Marine, Cleveland. —p. 619.

68 *Production of Antipneumococcus Serums. A. B. Wadsworth and M. B. Kirkbride, Albany, N. Y.—p. 629.

69 Experimental Studies on Lymphocytes. Reactions of Lymphocytes under Various Experimental Conditions. A. M. Pappenheimer, New York.—p. 633.

70 *Normal Fate of Erythrocytes. Findings in Healthy Animals. P. Rous and O. H. Robertson, New York.—p. 651.

71 *Id. Blood Destruction in Plethoric Animals and in Animals with Simple Anemia. O. H. Robertson and P. Rous, New York.—p. 663.

72 Elimination of Iron and Its Distribution in Liver and Spleen in Experimental Anemia. H. Dubin and R. M. Pearce, Philadelphia.—p. 675.

73 *Study of Acidosis, Blood Urea and Plasma Chlorids in Uranium Nephritis in Dog, and of Protective Action of Sodium Bicarbonate. K. Goto, Philadelphia.—p. 693.

74 Cicatrization of Wounds. Mathematical Study of Extrapolation Formula and Curve of Cicatrization. P. L. Du Noüy, France.—p. 721.

75 Digitalized Dog's Heart as Affected by Amyl Nitrite or Atropin, Studied Electrocardiographically. J. T. Halsey, New York. —p. 729.

76 *Spirocheta Icterohemorrhagia in American Wild Rats and Its Relation to Japanese and European Strains. H. Noguchi, New York.—p. 755.

66. **Cancer Immunity on Resistance to Tuberculosis.**—That lymphocytosis might be a factor in causing greater resistance to infection displayed by splenectomized animals is confirmed by experiments made by Taylor and Murphy. Mice splenectomized and then exposed to repeated small doses of Roentgen ray, which had been demonstrated to affect primarily the lymphoid organs, proved to be more susceptible, instead of more resistant, to infection than were either normal animals or animals splenectomized alone. Intact Roentgen-rayed mice were likewise highly susceptible to infection with the bovine tubercle bacillus. Morton has observed also that the Roentgen-rayed guinea-pig is more susceptible to infection with the human type of the tubercle bacillus than is the normal animal. The present communication deals with the influence of a pronounced lymphocytosis induced by other means than splenectomy on the resistance of the mouse to tuberculous infection. Mice first immunized to, and then inoculated with, a transplantable mouse cancer exhibit a greater resistance to bovine tuberculosis than do normal animals. On the other hand, while animals ineffectively immunized against cancer show a definite lymphoid reaction in the blood, it is less marked than when the immunity is perfect. Four mice of this kind outlived the controls but succumbed earlier than the completely immune ones.

67. **Transplantation of Spleen Tissue.**—Not one instance of permanent homotransplantation or autotransplantation of the spleen, or of the probably closely related splenolymph and hemolymph glands is on record. Spleen autotransplants with considerable difficulty as compared with thyroid, parathyroid, ovary or suprarenal cortex. This may be due to its complex anatomic structure. An instance of a permanent autotransplant has been observed by Manley and Marine. None of their attempts to homotransplant were successful beyond the usual taking and persistence for two or three weeks, common to all homografts. The successful permanent subcutaneous autotransplantation had all the morphologic characteristics of a fully differentiated and functionally active spleen.

68. **Production of Antipneumococcus Serums.**—A horse immunized by Wadsworth and Kirkbride with Type III (*Pneumococcus mucosus*) developed serum having a slight degree of protection for mice against the corresponding organisms. This serum was sufficiently potent, however, to cause prompt and complete agglutination when combined with fresh, untreated, homologous organisms, thus avoiding the preliminary treatment to remove the capsule which has previously been held necessary. As a diagnostic aid in the differentiation of pneumococcus strains, the serum has proved of distinct value.

70. **Normal Fate of Erythrocytes.**—The phagocytosis of red corpuscles, while frequent in the normal dog, rat and guinea-pig, according to Rous and Robertson, is slight in man, the rhesus monkey, and many rabbits. By a special method, it has proved possible to search the body, organ by organ, and the circulating blood also, for disintegrating red corpuscles. Shadows of red cells are not present anywhere, nor are hemolyzing red cells found. A hemolytic process, in the ordinary sense of the term, can scarcely play an important part in normal blood destruction. Instead, it is certain that some red corpuscles, at least, are destroyed in another way; namely, by fragmentation. Normal blood regularly contains small numbers of fragmentation forms—microcytes and poikilocytes—and accumulations of them are regularly present in the spleen, but are found only inconstantly in the other organs. The fragments are in evident process of further subdivision. They occur not only in species in which phagocytosis as a means of cell destruction is negligible (cats), but also in animals in which it is an important process (dogs, some rabbits).

71. **Blood Destruction in Plethora and Simple Anemia.**—Robertson and Rous state that the increased destruction of red cells in animals rendered plethoric by transfusion takes place predominantly by a fragmentation of the corpuscles without loss of hemoglobin. The microcytes and poikilocytes observed in animals with a severe anemia due to hemorrhage are not put forth as such by the bone marrow, but are portions of cells fragmented while circulating. The cells thus fragmented are for the most part those new formed to meet the exigencies of the situation. Such cells are in large part unable to withstand the wear and tear of function. There results a vicious circle. The anemia renders the bone marrow unable to put forth proper cells, and those it does produce are soon destroyed, thus prolonging the condition. A similar state of affairs probably exists in many human anemias. The occurrence of large accumulations of microcytes and poikilocytes in the spleen of anemic and plethoric animals indicates that the organ exercises some important function in connection with these forms. The same is true of normal animals, for the findings in them are similar, though less striking. The normal fate of red corpuscles, in those species in which phagocytosis is negligible, is to be fragmented one by one, while still circulating, to a fine, hemoglobin containing dust. The cell fragments are rapidly removed from the blood, but their ultimate fate remains to be determined. The facts indicate that they are removed from the blood by the spleen, and under exceptional conditions, by the bone marrow.

73. **Acidosis in Uranium Nephritis.**—The presence of an acidosis in dogs with experimental uranium nephritis, Goto says, is demonstrable by the Van Slyke-Stillman-Cullen method and that of Marriott. It is detected more readily by the former method. This acidosis is associated with increase in the blood urea and plasma chlorids and with the appearance of albumin and casts in the urine. The oral administration of sodium bicarbonate diminishes the acidosis, the increase in plasma chlorids, the amount of albumin and casts in the urine, and, to a lesser degree, the increase in the blood urea following the administration of uranium. It also diminishes the severity of the changes produced by uranium

in the kidneys. The oral administration of sodium bicarbonate to normal dogs raises the carbon dioxid content of the plasma, as determined by the Van-Slyke-Stillman-Cullen method.

76. **Spirochete Icterohemorrhagia in Wild Rats.**—The principal points brought out by Noguchi are the following: 1. Wild rats captured in this country carry in their kidneys a spirochete which possesses the morphologic and pathogenic properties characteristic of *Spirochacta icterohemorrhagica*, discovered by Inada in the Japanese form of infectious jaundice. 2. Cultures of the American, Belgian and Japanese strains of the spirochete were obtained by a special technic described, the first two strains having been cultivated artificially for the first time. 3. Animals actively immunized against the Japanese strain resist inoculation, not only of the same strain, but also of the Belgian and American strains. The Belgian strain produces immunity equally effective against all three strains. Experiments to ascertain whether the immunity afforded by the American strain also protects against the Japanese and Belgian strains are in progress. These findings warrant the conclusion that the spirochetes designated here as the Japanese, Belgian and American strains are probably identical. On account of its distinctive features, a new genus, *Leptospira*, has been suggested as the designation of this organism.

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77 Congenital Cerebrocerebellar Diplegics; Their Training Treatment. L. P. Clark, New York.—p. 751.
78 Surgical vs. Tuberculin Treatment of Renal Tuberculosis. L. Buerger, New York.—p. 760.
79 Report of Thirty-Five Cases of Perisinus and Extradural Mastoid Abscess. H. B. Blackwell, New York.—p. 763.
80 Obstruction of Appendix. W. H. Barber, New York.—p. 766.
81 Home Convalescence. F. Brush, White Plains.—p. 768.

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82 Types of Delinquent Careers. B. Glueck, New York.—p. 171.
83 Efficiency and Inefficiency—Problem in Medicine. P. Bailey, New York.—p. 196.
84 Standardized Fields of Inquiry for Clinical Studies of Borderline Defectives. W. E. Fernald, Waverly, Mass.—p. 211.
85 Educational Methods and Fundamental Causes of Dependency. C. M. Campbell, Baltimore.—p. 235.
86 Some Criteria for Evaluation of Mental Tests and Test Series. F. Mateer, Waverly, Mass.—p. 241.
87 How May We Discover Children Who Need Special Care? R. M. Yerkes, Boston.—p. 252.
88 Feeblemindedness as Seen in Court. V. V. Anderson, Boston. —p. 260.
89 Community Value of Outpatient Department of Hospital for Insane. J. B. MacDonald, Hathorne, Mass.—p. 266.
90 Subsidizing Mental Deficiency—"Pauper Idiot Act" of Kentucky. T. H. Haines, Columbus.—p. 274.
91 Care and Treatment of Insane in County Institutions of Pennsylvania. W. C. Sandy, Columbia, S. C.—p. 279.

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92 Model Hospital Established and Managed by Chinese. W. Lien-Teh.—p. 241.
93 Hospital Work in Island of Porto Rico. E. R. Hildreth, San Juan, P. R.—p. 245.
94 How a Real Hospital Started and Grew. L. O. Wight, New York. —p. 247.
95 Story of Institutional Library. M. H. Burgoyne, White Plains, N. Y.—p. 251.
96 Skim Milk as Food. J. P. Street, New Haven, Conn.—p. 253.
97 Standardization of Hospitals; Introduction and Classification. J. A. Hornsby, Chicago.—p. 256.
98 Architecture and Equipment of Jordan Hospital, Plymouth, Mass. C. G. Mixter and H. F. Kellogg, Boston.—p. 258.
99 Hospital Organization in Rural Pennsylvania. H. L. Foss, Danville, Pa.—p. 275.
100 What Sisters Should Contribute to Team-Work. M. Esperance, Minneapolis.—p. 276.
101 Diagnosis of Heart Cases. A. Bacon and F. M. Smith, Chicago. —p. 279.

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103 Cardiac Remedies. P. H. Markley, Camden.—p. 141.
104 Sleep and Proper and Improper Methods of Sleeping in Relation to Health and Disease. J. A. Maclay, Paterson.—p. 144.
105 Infantile Paralysis. M. Frank, Bayonne.—p. 147.
106 Case of Myocardial Exhaustion Producing Angina Pectoris. D. W. Scanlan, Atlantic City.—p. 152.

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107 Symptoms of Measles. S. F. Brand, New Orleans.—p. 739.
108 Ear, Nose and Throat Complications of Measles. H. Dupuy, New Orleans.—p. 741.
109 Ocular Complications of Measles. C. A. Bahn, New Orleans.—p. 745.
110 "D'Espine Sign Valuable Aid in Diagnosis of Pulmonary and Tracheobronchial Glandular Tuberculosis in Childhood. C. J. Bloom, New Orleans.—p. 748.

110. **D'Espine Sign in Diagnosis of Tuberculosis.**—Bloom reports seventeen cases, in which the "d'Espine sign" was positive, and the diagnosis made before these respective cases were diagnosed as such by Roentgen ray. The tuberculin reaction proved positive in three of the seventeen cases.

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111 United States Naval Hospital and Medical School. R. C. Ransdell, Washington, D. C.—p. 817.
112 Roentgen Findings in Upper Right Abdomen. A. J. Quimby and W. A. Quimby, New York.—p. 821.
113 Stenosis and Stricture of Ureter. L. Buerger, New York.—p. 826.
114 Study of Drug Action. T. J. Mays, Philadelphia.—p. 832.
115 Is Epilepsy Bacterial Infection? J. F. Munson, Sonyea.—p. 836.
116 Warning About Rickets, B. Robinson, New York.—p. 837.
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121 Health Center Field Work. A. C. Schaefer, Buffalo.—p. 176.
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140 Internal Secretory System and Eye. R. S. Lamb, Washington, D. C.—p. 434.
141 Practical Value and Limitations of Tonometer. E. Jackson, Denver.—p. 437.
142 Art of Refraction. H. S. Gradle, Chicago.—p. 447.
143 Dumb Bell Keratitis. L. H. Buxton, Oklahoma City.—p. 450.
144 Clinical Study of Three Cases of Sarcoma of Chorioid and Ciliary Body. H. H. McGuire, Winchester, Va.—p. 454.

South Carolina Medical Association Journal, Greenville

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145 How to Increase Individual and Collective Efficiency of Medical Profession of South Carolina. C. B. Earle, Greenville.—p. 498.
146 Vaginal Cesarean Section. G. F. Wilson, Charleston.—p. 501.
147 Study of Medicine. W. F. R. Phillips, Charleston.—p. 504.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

January-March, XIV, Nos. 157-159

1 Malformation of Esophagus. E. Cautley.—p. 1.
2 *Infective Theory of Acute Leukemia. G. Ward.—p. 10.
3 *Isolated Nasal Diphtheria. J. D. Rolleston.—p. 21.
4 Cerebral Diplegia with Abnormal Flexibility (Atony or Hypotonia) of Ankle Joints. F. P. Weber.—p. 31.
5 Case of Cyclic Vomiting with Acetonemia (Acidosis). Nondiabetic Acetonuria and Diaceturia. F. P. Weber.—p. 33.
6 Case of Heart Failure During Operation for Removal of Tonsils and Adenoids; Heart Massage Through Abdominal Incision; Recovery. W. M. Mollison.—p. 42.
7 Retrospect of Otology. M. Yearsley.—p. 47.

2. **Infective Theory of Acute Leukemia.**—The evidence presented by Ward is almost entirely against the infective nature of leukemia, the established facts being: (1) There is a congenital form of leukemia which occurs in children whose parents are not leukemic; (2) leukemic parents have never been known to transmit the disease to the new-born child; (3) instances in which actual infection of one person by another might seem to have occurred are very few, although not necessarily devoid of significance; (4) in having a marked preference for a particular sex and age, leukemia differs from the infective class of diseases, and resembles the metabolic diseases and cancers.

3. **Isolated Nasal Diphtheria.**—Among 3,000 cases of diphtheria under Rolleston's care there were only fifty-five cases or 1.5 per cent. examples of isolated nasal diphtheria, that is, diphtheria starting in the nose and remaining confined to that site, as compared with 620 cases, or 20.6 per cent., in which nasal diphtheria was associated with diphtheritic angina. The diagnosis in each case was confirmed by bacteriologic examination. With the exception of four infants who were suffering from congenital syphilis, all the patients had been in good health until the time of their attack of diphtheria. None had been recently suffering from scarlet fever or measles which so frequently precede nasal diphtheria.

British Medical Journal, London

April 14, I, No. 2937

8 *Mouth Washes in Health and Disease. H. P. Goodrich.—p. 473.
9 Treatment of Fractures by Splints. C. A. Morton.—p. 475.
10 *Recent Results in Serum Treatment of Cerebrospinal Fever. A. G. Robb.—p. 478.
11 Etiology of Dysentery. C. J. Martin and F. E. Williams.—p. 479.
12 Metastatic Gas Gangrene. J. N. J. Hartley.—p. 481.
13 Skin Grafting. D. G. Greenfield.—p. 482.
14 Another Wandering Shrapnel Ball. H. I. Gregory.—p. 482.

April 21, No. 2938

15 Wounded as We See Them at Home. W. C. Allardice.—p. 501.
16 *Metabolic Changes Produced by Allen Treatment of Diabetes Mellitus. P. J. Cammidge.—p. 503.
17 Variations in Weight of Tuberculous Under Sanatorium Treatment. J. H. Smith.—p. 505.
18 *Method of Anesthetizing Soldiers. W. J. McCardie.—p. 508.
19 Multiple Severe Injuries from Bomb Explosion; Operation; Recovery. N. Davidson.—p. 509.
20 Value of Feeding During Operation as Preventive of Surgical Shock. H. H. Brown.—p. 510.
21 Case of Cerebral Abscess of Otic Origin. H. Bodkin.—p. 510.
22 Treatment of Trench Feet by Subcutaneous Injection of Oxygen. H. O. Smith.—p. 511.

8. **Mouth Washes in Health and Disease.**—The experiments made by Goodrich show that a saturated aqueous solution of thymol is a very good antiseptic for ordinary mouth bacteria. Boric acid has given disappointing results. A saturated solution must act for more than two minutes to be effective, and was by no means always satisfactory in five minutes. Iodin would obviously not make a satisfactory mouth wash for general use. Hypochlorite solutions are not suitable for general use owing to their instability. Hydrogen peroxid solutions are too readily reduced to be successful in the hands of an ordinary patient. Potassium permanganate, another oxidizing agent and deodorant, is sometimes used as a mouth wash. It is by no means ideal, being only a weak antiseptic, and, in addition to staining the teeth, has an unpleasant taste. With zinc sulphocarbolate, a 10 per cent. solution, Goodrich never once obtained complete sterility.

10. **Serum Treatment of Cerebrospinal Fever.**—The most hopeful line of treatment in Robb's opinion is by lumbar puncture, drainage, and the intrathecal injection of carefully prepared polyvalent antimeningitis serum; and the most important factors which make for success are early treatment and sufficient dosage.

16. **Allen Treatment of Diabetes Mellitus.**—Some 8,000 specimens from over 500 cases of diabetes, including fifty-four treated by Allen's method, have been examined by Cammidge. One of the most striking results has been the frequency with which indications of chronic catarrh of the upper intestinal tract were found (71 per cent.). Signs of some interference with the digestive functions of the pancreas were met with in 72 per cent. In most of them (67 per cent.) there were also indications that the functions of the liver were being imperfectly carried out, while in 27 per cent. the hepatic disturbance was more pronounced, apparently, than the pancreatic. Cammidge, therefore, recognizes three types: (1) the pancreatic, (2) the hepatic and (3) the pancreohepatic. The outlook for patients with a cirrhotic pancreas is fairly good, provided a suitable diet is adopted. They are not materially benefited by starvation, and as their digestive powers for all three classes of foodstuffs are defective it is more important to ensure adequate nourishment than to worry over the traces of sugar they generally pass.

Cammidge does not look on Allen's fasting treatment as the best for all forms of glycosuria, but considers that it marks a great advance in the available methods, and gives results that can be obtained by no other means in many instances. It must be used with judgment, however, and one should always bear in mind that the keynote of the treatment is undernutrition. A practical question that sometimes arises is, whether a controlled, and may be mild glycosuria with an adequate diet and reasonable enjoyment of life, is not preferable to the theoretical ideal of permanently sugar free urine, which can only be secured by a diet that will not satisfy the pangs of hunger, and requires constant close supervision. The answer will depend on circumstances and the temperament of the patient. These should be considered carefully before advising the treatment, as once it is begun it must be persevered with, since a return to an ordinary carbohydrate free diet always brings about a rapid increase in the acidosis, with excessive tissue waste and death from diabetic coma.

There is more danger of serious acidosis during the starvation of fat than thin diabetics; when acidosis is present the patient should be prepared for starvation by a fat-free, protein-poor, diet for several days; an initial increase in the acidosis is to be expected in most cases, but should not put a stop to the treatment unless it assumes threatening proportions. When this occurs the fast should be terminated for the time being and the treatment directed to the acidosis. A restricted diet and alkaline therapy for a few days will generally serve to control the condition, when a further fast will usually result in improvement in carbohydrate metabolism without increasing the acidosis. During the fasting period as much exercise as practicable should be taken, as it shortens the duration of the fast. After feeding is commenced the exercise should be continued, short periods of vigorous exercise after meals being preferable to long walks. Excessive fatigue should be avoided. Mental occupation is also most desirable, and patients should be encouraged to continue, or resume, their ordinary work if possible.

18. **E-C Method of Anesthetizing Soldiers.**—The best all round mixture would be one in which the respiration and circulation are very slightly stimulated by the addition of a little more ether, thus ensuring safety and counteracting any shock arising from the operation. McCardie's idea is to take ether as the standard of safety and so to dilute or modify its action as to obtain some of the advantages of chloroform anesthesia. Ether thus modified by chloroform, is said to possess practically the safety of pure ether. The author uses 16 parts of ether to 1 of chloroform. He terms this mixture "mitigated ether." As a preliminary to the administration of ether, or $E_{16}C_1$, McCardie prefers a few drops of E_2C_1 to ethyl chlorid. For maintenance of anesthesia E_2C_1 or chloroform

are preferable to even "mitigated ether," owing to the prevalence of respiratory irritability among soldiers.

Lancet, London

April 21, I, No. 4886

23 War Surgery of Abdomen. C. Wallace.—p. 597.
24 *Studies in Wound Infections; Question of Bacterial Symbiosis in Wound Infections. S. R. Douglas, A. Fleming and L. Colebrook.—p. 604.
25 Clinical Types of Subtertian Malaria. A. W. Falconer and A. G. Anderson.—p. 607.
26 Symptomatology of Paratyphoid Fever. J. M. Fortescue-Brickdale.—p. 611.
27 Improved Method for Estimation of Sugar in Urine and Blood. P. J. Cammidge.—p. 613.

24. Studies in Wound Infection; Symbiosis.—The experiments described by Douglas and his associates show that the proliferation of *B. perfringens* is much more rapid when it is grown in symbiosis with streptococcus, staphylococcus, various diphtheroid bacilli, *B. proteus, B. pyocyaneus,* and a coliform bacillus. All strains of diphtheroid bacilli, commonly isolated from wounds, were found to be practically equally efficient in stimulating the growth of *B. perfringens.* Not only were a much larger number of *B. perfringens* found in the cultures grown in symbiosis with these various bacilli after a certain period of incubation, but it was also found that an almost infinitely smaller number of *B. perfringens* would proliferate under these conditions than when pure cultures were made. When *B. perfringens* and streptococci are grown in symbiosis, a much more abundant growth of both microbes results. These experiments indicate that bacterial symbiosis may play a very important rôle in wound infections.

Medical Journal of Australia, Sydney

March 24, I, No. 12

28 War Surgery at Front. C. MacLaurin.—p. 241.
29 Milk Curdling Properties of Pancreatic Juice, H. G. Chapman and A. H. Moseley.—p. 243.
30 Vasomotor Disturbances in Raynaud's Disease. A. W. F. Noyes.—p. 247.

March 31, No. 13

31 Healthy House Building. J. Nangle.—p. 265.
32 Prolapse of Female Bladder. A. J. Nyulasy.—p. 272.

April 7, No. 14

33 Developmental Cysts of Ureter and Renal Pelvis in Case of Unilateral Pyelonephritis. S. H. Harris and D. A. Welsh.—p. 291.

Archives des Maladies du Cœur, etc., Paris

March, X, No. 3, pp. 97-144

34 Character of the Heart Murmurs with Congenital Cyanosis. (Des caractères des souffles cardiaques dans la maladie bleue.) L. Bard.—p. 97.
35 *Possibility of a Reflex Arterial Systole. R. Wybauw.—p. 107.
36 Successful Extraction of Bullet in Wall of Left Ventricle. J. Duvergey.—p. 122.

35. Theories in regard to the Circulation of Blood in the Vessels.—Wybauw recalls that, according to the accepted theory of the circulation, the blood is impelled by the systole of the ventricles and the elasticity of the arteries stores up some of this expulsive force of the heart and restores it. The muscular fibers are not supposed to do much more than to maintain the regular lumen of the vessel. His experience at Spa, noting the effects of carbonated baths on hundreds of patients, soon convinced him that these prevailing views do not harmonize with the phenomena he was constantly encountering. We know that circulation occurs in some living beings without a differentiated heart, and in the embryo before the heart has been formed. Certain research workers have reported that the blood pressure may be higher in the rear than in the front legs or carotid of animals, especially the differential pressure. Another argument in favor of the conception of an active systole of the arteries is that the blood pressure in the portal vein may be higher than in the vessels that precede it. Wybauw gives an illustrated description of an apparatus which reproduces the conditions of the natural circulation, and confirms the necessity for assuming the existence of certain still unsuspected factors in the circulation and the probability of an active systole in the arteries. He gives tracings obtained with it and from experimental research, commenting that it is very improbable that a 1:40,000 dose of epinephrin or 1:10,000 of morphin could instantaneously modify the elasticity of the arteries enough to explain the effects observed, while they are easy to comprehend by assuming the existence of a muscular contraction exaggerated or diminished under the influence of substances increasing or reducing the tonus of the vessel wall. Everything, he says, seems to sustain the assumption of a reflex arterial systole following immediately on the shock of the pulse beat. In this connection he mentions that Richat and Benjamins, in the research laboratory of the University of Utrecht, have recently demonstrated the existence of waves of peristalsis in the lacrimal canal.

Archives Médicales Belges, Paris

March, LXX, No. 3, pp. 193-288

37 *Rarity of Sympathetic Ophthalmia after War Wounds. L. Weekers.—p. 193.
38 Icterohemorrhagic Spirochetosis; Forty-Seven Cases. L. Wilmaers and E. Renaux.—p. 207. Conclusion.
39 Advantages of Wright's Physiologic Method of Treating War Wounds. Goormaghtigh.—p. 225.

37. Sympathetic Ophthalmia in Wounded Soldiers.—Weekers remarks that one of the unexpected happenings in the war is the extreme rarity of sympathetic ophthalmia, notwithstanding the great frequency of war wounds of the eyes. In his personal experience he has encountered only one instance of it among 800 cases of war injury of one eye. He recalls that during the Franco-Prussian war of 1870 fully 55 per cent. of the wounds of one eye were followed by sympathetic ophthalmia, and even during peace times it averages 11.6 per cent. according to Hobby's statistics, and 21 per cent. after unsuccessful cataract operations, according to Steffen. He has found only a very few cases mentioned in accessible literature during the war, while many comment on the rarity of the sympathetic involvement of the other eye. These facts justify conservative treatment of the wounded eye, unless one's hand is forced by irritation and pain. It is much better, he thinks, to retain the eyeball, even with vision entirely lost, than to be forced to depend on a complete prosthesis. He is inclined to ascribe the rarity of sympathetic ophthalmia nowadays to the asepsis and antisepsis which are now so generalized, adding that the day when operators will take as many precautions before opening an eye as for a laparotomy, postoperative sympathetic ophthalmia will very nearly disappear completely. All the wounded in the war are placed at once in hospitals where the discipline of asepsis reigns, and there is no need to remove a wounded eye for the sole reason of warding off sympathetic ophthalmia. There is no hurry; one can at least wait a few days. If the eyeball has to be sacrificed, he advises exenteration as giving a better stump while it offers fully as many guarantees against sympathetic ophthalmia as enucleation.

Bulletin de l'Académie de Médecine, Paris

March 27, LXXVII, No. 13, pp. 409-423

40 *Radiotherapy for the Sequels of Skull Wounds. G. Bonnus, M. Chartier and F. Rose.—p. 418.
41 Anomalies in First Ribs. A. Clerc, R. Didier and J. Bobric.—p. 421.

April 10, No. 15, pp. 481-510

42 *Relations between Diabetes and Cancer. A. Robin.—p. 481.
43 *Pedunculated Grafting Operations from Donor to Recipient: Four Siamese Grafts of Femur or Humerus. O. Laurent.—p. 488.
44 *The Rôle of the Thyroid and Parathyroids in Uremia. A. Rémond and Minvielle.—p. 504.
45 Necrosis and Gangrene after Subcutaneous Injection of Quinia. (L'abcès quinique.) Prat-Flottes and H. Violle.—p. 507.
46 Opaque Drains to Aid in Roentgenoscopy. O. Pasteau.—p. 509.

40. Roentgenotherapy of Disturbances Left from Wounds of the Brain and Spinal Cord.—Bonnus and his co-workers report favorable experiences from Roentgen exposures in treatment of localized or reflex phenomena from irritation of the dura, sequels of wounds of the skull. Also in motor or sensory jacksonian epilepsy, in the phenomena of reflex epilepsy, and in certain cases of spastic paralysis from superficial injury of the brain. Some months ago they published a favorable report on roentgenotherapy in treatment of trau-

matic affections of the spinal cord and peripheral nerves. If adhesions are not too extensive and too stout, the Roentgen exposures facilitate their absorption. They also act beneficially on cicatrices left by small hemorrhagic lesions. These cicatrices in the meninges or brain are the cause of incessant irritation of cells and motor fibers, and any tendency toward a return to normal conditions is a great gain. Of course the exposures are unable to restore destroyed tissues, so the cases must be selected with care.

42. **Relations between Diabetes and Cancer.**—Robin cites Boas to the effect that in 55 cases of cancer of the digestive tract he found that 12 of the patients were diabetics. In Robin's own experience among 144 fatal cases of diabetes, 12 of the patients had cancer, a proportion of 8.3 per cent. In his cases the cancer was of rapid development, from fifty days to five months in 5; from six to seven months in 4, and only in 3 instances was the interval before death from thirteen months to two years. Some connection between the intensity of the diabetes and the rapidity of the development of the malignant disease seems manifest in both Robin's and Boas' series. He does not know of any record of diabetes developing after the onset of cancer, except possibly in the rare cases of cancer of the pancreas. Two cases published by Verneuil suggest the possibility that intercurrent diabetes may transform a benign into a malignant tumor. Robin noted that obtaining control of the diabetes seemed to check the rapid growth of the cancer. In his one case of cancer of the rectum the subsidence of the glycosuria under proper treatment was followed by an increase in weight and the cancer did not prove fatal until the end of the second year. The records show further that operations for removal of the cancer are liable to have serious results on account of the tendency to fatal coma thereafter. It is better, he declares, to refrain from operating if the urine contains acetone products and the diabetic patient is much debilitated. On the other hand, removal of the cancer is justified with incipient cancer even when the diabetes is severe. Especially in cases of cancer of the breast, the removal of the cancer permitted long survival. He adds in conclusion that six of the twelve cases in his practice were hospital patients. Others have encountered cancerous diabetics only in private practice.

43. **Siamese Grafts.**—Laurent reports four cases in which he repaired an extensive gap in the femur or humerus by a pedunculated graft from another person, the donor and recipient fastened together for eight or ten days. In one case a gap in the femur was thus restored by a stretch of the femur from a man whose leg had been amputated, and it required shortening of the excess of femur left. In the second case the gap in the humerus was repaired by the fibula with the periosteum from the tibia. In each case the redundant bone after amputation was used for the graft, and the results obtained confirmed in every respect the anticipations derived from his previous experimental research in this line of symbiosis grafts. To date the results in his four clinical cases are satisfactory. Consolidation is complete in the first case and nearly complete in another. One of the recipients is obese and has eczema, which renders the outlook dubious in his case. Each case is described in detail, each representing a different type of technic. The wounds had been severe and it was a question of amputation otherwise.

44. **Influence of Thyroid and Parathyroids on Uremia.**—Rémond and Minvielle here report further research on the rôle of the thyroid and parathyroids in uremia. They found that the animals survived longer after nephrectomy when the parathyroids had been removed with the thyroid than after thyroidectomy alone. Removal of the thyroid and of the kidney did not seem to affect the suprarenals particularly, but when the parathyroids had been removed along with the thyroid, the suprarenals showed evidence of intensely increased functioning. In six animals an interval of forty-eight or seventy-two hours was allowed to elapse before the kidney was removed after the thyroid-parathyroidectomy. The kidneys were invariably pathologic and the uremia was more intense. The data related apparently demonstrate that the endocrine glands have something to do with the development of uremic accidents. Their influence may be shown by an improvement (thyroid) or by a lowering of the resisting powers (parathyroids).

Journal de Médecine de Bordeaux

April, LXXXVIII, No. 5, pp. 83-100

47 *Surgical Experiences at the Front with the More Severely Wounded. (Une ambulance de grands blessés à Verdun.) J. Lalesque.—p. 83.
48 Paralysis from Pressure on Facial Nerve after Fracture of Petrous Bone. Operative Correction and Cure. Brindel.—p. 87.
49 An Epidemic of Dysentery. P. Mauriac.—p. 89.
50 Camp Garbage Incinerators. P. Lande.—p. 95.
51 Minute Proportions of Copper in Vegetables and Meats. (A propos du cuivre dans les tomates.) P. Carles.—p. 97.

47. **Treatment of Wounded Unable to Be Moved.**—Lalesque relates that during his seventy days' work in charge of an ambulance at Verdun he made a practice of getting the severely wounded to bed at once, with Mencière's balsam to the wound, giving warm drinks and stimulants, keeping the body warm and injecting saline and camphorated oil, resisting the temptation to operate first. Then watching over him he was ready to operate at the first feasible moment, five, eight, ten hours after his arrival. Men with wounds of the chest were placed seated in bed, with plenty of dressings, and were sent to the base hospital early, no attempt at operation being made in the field station. His experience with abdominal wounds was that the men would either recover without intervention or were irremediably doomed, and he never operated in this class of cases during his Verdun days. Some of those supposed to be doomed finally recovered or were able to stand an operation later. When amputation was necessary, he aimed to do it as rapidly as possible, striving to keep the shock down to the minimum. He found metal retractors for the soft parts indispensable in amputating; no other means of guarding and saving the soft parts answered the purpose in these amputations when it was a question of saving life rather than of making an elegant stump. The stumps thus obtained were functionally excellent. He never cut flaps, but saved as much of the skin as possible, and the wounds kept a good aspect under compresses wet with Dakin's solution. No attempt at suturing was made as there was no assurance of asepsis in those hurried days of carnage, and he did not have the equipment for Carrel treatment.

Paris Médical

April 7, VII, No. 14, pp. 261-292

52 Tuberculosis Suspects. E. Sergent.—p. 263.
53 Welfare Work for Tuberculous Soldiers during and after the War. L. Bernard.—p. 268.
54 Pleurisy and Tuberculosis. Morichau-Beauchant.—p. 272.
55 Early Operative Treatment of Wounds of the Thorax and Lung. A. Latarjet.—p. 275.
56 Extraction of Foreign Bodies in the Lungs. J. Guyot.—p. 280.
57 The Working Capacity of the Tuberculous for Outdoor Work. A. Vigné.—p. 284.

Presse Médicale, Paris

March 29, XXV, No. 18, pp. 177-184

58 *Is Chronic Renal Tuberculosis Ever Curable? N. Hallé.—p. 177.
59 *Prophylaxis of Infection in War Wounds by Powdering with Calcium Hypochlorite. H. Vincent.—p. 180.
60 *The Blood Count After War Wounds. (Quelques enseignements cliniques fournis par l'examen du sang après les blessures.) P. Govaerts.—p. 180.

April 2, No. 19, pp. 185-200

61 *Dehydration of Blood and Organs in Diabetic Coma. A. Chauffard, Le Conte and Dorie.—p. 185.
62 Polyvalent Serotherapy in Treatment of Wounds. E. Leclainche and H. Vallée.—p. 187.
63 Meningitis in Icterohemorrhagic Spirochetosis. S. Costa and J. Troisier.—p. 189.
64 Present Status of Our Knowledge of Action of Epinephrin on Cardiovascular Apparatus. L. Binet.—p. 191.

58. **Curability of Renal Tuberculosis.**—Hallé declares that an anatomic cure of tuberculous processes in the kidneys has been definitely established as a fact only in one form of chronic renal tuberculosis, namely, closed parenchymatous tuberculous processes. With other forms it may be possible, but it has not been proved to date. Tubercles in the kidney may shrivel into hard bunches with loss of substance and

more or less complete fibrous scars. This form of healing occurs, he says, in about 33 per cent. of the cases. The various stages of this shriveling and loss of substance, deforming the kidney, are shown in a number of illustrations. Spontaneous, medical healing cannot be counted on with any certainty, however, so that nephrectomy is still as ever the most reliable means of curing renal tuberculosis.

59. **First Treatment of War Wounds.**—Vincent reiterates here his plea for dusting war wounds thick with a dry powder consisting of calcium hypochlorite and boric acid in the proportions of 1:10. This prophylactic treatment is particularly useful when the wounded are coming in in large numbers. The powder can be applied again the next day, if there is delay in getting the wounded to the hospital. This powder has a powerful sterilizing action and seems to ward off gas gangrene. It has been called the ideal dressing for the battle field.

60. **The Blood Findings in the Wounded.**—Govaerts reproduces some charts which show that after a serious wound the red and white counts are both high. If in the six hours after the wound the reds have dropped to 4,000,000 or below, while the whites have climbed to 30,000, we can be sure there is a serious hemorrhage and the outlook is grave. Saline infusion is not enough in this case; transfusion of blood is called for. If internal hemorrhage is suspected, high leukocytosis confirms the necessity for operative intervention. In one such case, the number of reds was normal but the whites numbered 31,600. The laparotomy revealed complete rupture of the spleen. In the course of treatment of a wound, if the reds increase suddenly in numbers, a reaction on the part of the peritoneum or effusion in some serous cavity can generally be found to explain it. When the number of reds shows a gradual decline through four days, infection is usually installed. In a typical case described, the arm had been torn out by a shell. The reds numbered 4,800,000 at once, but the third day only 2,780,000 were found. The man seemed to be doing well, but the next day the reds had climbed to 4,700,000 and the whites began to show an upward tendency, having dropped previously from 31,000 to 11,000. The man died the next day from peritonitis, a scrap of the shell having injured the liver.

61. **Dehydration of Blood and Organs in Diabetic Coma.**—Le Conte and Dorie comment on the evident signs of dehydration which are common in diabetic coma, but they do not regard them as the cause of the coma. They appear only after the latter is under way. The dehydration shows most in the eyeball. In two typical cases related in detail, the necropsy findings corresponded to the degree of dehydration evidenced during life. The specific gravity of the blood was 1.064 and 1.068, while the reds in the woman of 31 numbered 8,340,000. In the other patient, a man of 66, the composition of the blood had been modified by copious drinking of water and the reds dropped nearly to half their original figure. The pressure in the arteries may be so low as to amount to actual heart failure, with suppression of urine secretion. The coefficient of dehydration in the two cases was for the liver 15 and 20 per thousand; for the brain 30 and 5; for the kidneys 60 and 40 and for the pancreas 95 and 45 per thousand. The dehydration is evidently most pronounced in the parenchyma of the kidneys and pancreas. The data presented warn that in treatment of diabetic coma it is wise to avoid hypertonic solutions of sodium bicarbonate on account of the extreme concentration of the blood. A hypertonic solution would dehydrate the blood still more, and this might leave a clump of corpuscles to plug the vein.

Beiträge zur klinischen Chirurgie, Tübingen

XCIX, No. 2, pp. 253-474. Last indexed Aug. 7, 1915, p. 563

65 *Grafts of Normal Tissue between Blood Relations. G. Schöne. —p. 233.
66 Volvulus with Ileus from Strangulation by Persisting Omphalo-Enteric Duct. Meissner.—p. 265.
67 *Fistula of the Anus. E. Göz.—p. 268.
68 Morphology of the Stomach after Resection. C. Göcke.—p. 294.
69 Disinfection of the Skin with Pure Alcohol. J. Strauss.—p. 383.
70 Restoration of Larynx and Trachea. (Ueber plastischen Ersatz von Kehlkopf-Luftröhrendefekten.) W. Capelle.—p. 403.
71 Intestinal Polyposis. Borelius and Sjövall (Lund).—p. 424.
72 Tuberculous Stricture of the Small Intestine. P. Carlsson (Lund). —p. 455.

65. **Homoplastic Transplantation of Normal Tissues.**—Schöne's extensive experience with transplants of normal skin between rats, mice and rabbits of the same families showed that occasionally the grafts from blood relations healed in place and grew, although many of the implants were finally cast off. The grafts between parents and young were not successful so often as between the young of a litter. There was also often a difference in the outcome between grafts on the parents from different ones among the young. This suggests that possibly the Mendelian or other laws regulating heredity may influence the outcome of the graft. The occasional success of grafts on the young from the male parent or vice versa shows that the suckling of the young is not indispensable to the transplantation. Schöne knows of only one other worker who has experimented in this line with normal tissues. He regards it as a most promising field for further research, and suggests that a tentative preliminary graft of skin might be utilized in the clinic to ascertain the prospects for successful implantation of thyroid, kidney or other important tissues in special cases. Four colored plates and a few other illustrations reproduce some of the successful grafts. One shows the almost normal growth of the fur on the large patch of grafted skin on the back of a mother mouse nineteen months later. The graft had been taken from a 3 months old mouse from her last litter.

67. **Fistula of the Anus.**—Göz has been able to trace to date 55 of 95 patients with fistula of the anus given operative treatment in Angerer's surgical service in the ten years before 1913. No operation was attempted in 4 cases and the outcome is not known in 40 others. The entire 95 cases are reported in detail. Of the 55 followed to date, 27 were cured; 13 not cured, and 5 have died from unknown cause and 6 from the progress of their tuberculosis. Fully 43 per cent. of all those patients seemed to be tuberculous, but the recovery of 8 in this group showed that the anal fistula was a local process. Other causes are injury from a foreign body and hemorrhoids. Diabetes and typhoid seem to have been a factor in some of the cases, the former indirectly by favoring tuberculosis. Severing the sphincter at one point does not entail incontinence, but if it is cut at more than one point incontinence is almost inevitable. Cauterizing the fistula with the actual cautery cured the fistula in 67 per cent. of the cases. A supplementary operation was required to accomplish this in 14 per cent. of the others. Statistics from other clinics are compared with these, all emphasizing that tuberculosis reduces the chances for recovery and recurrence is not infrequent unless the fistula is merely a local process, in which case a complete cure after excision can be counted on.

This copy of the *Beiträge* and another—review to follow—were brought from Germany by one of the physicians of an American unit that has recently returned to this country. He presented the copies to the medical reference library (Crerar Library) in Chicago.

Correspondenz-Blatt für Schweizer Aerzte, Basel

April 7, XLVII, No. 14, pp. 417-448

73 *Sudden Death from Insufficiency of the Epinephrin Producing System. (Sogen. Minutenherztod.) O. Steiger.—p. 418.
74 Anicure Prophylaxis and Treatment of Hemorrhoids. F. Fortmann.—p. 431.
75 *Eclampsia without Convulsions or Loss of Consciousness. F. Chatillon.—p. 434.
76 Small Epidemic of Infectious Sore Throat with Eruption. C. Fischer (Montana).—p. 437.

73. **Sudden Death from Insufficiency of the Epinephrin-Producing System.**—Steiger has had a personal experience of four cases of sudden death which he ascribes to this cause. There were no symptoms suggesting Addison's disease in the first case, but necropsy revealed cheesy degeneration in both suprarenals, as also in the suprarenals of the second and third patients who both presented the typical picture of Addison's disease, one with persisting thymus at the age of 26. The others were men of 70 and 41. The sudden death

followed some special physical exertion. The fourth patient was a man of 42 with pigmentation of exposed regions but none elsewhere. He came to the hospital under the diagnosis of cardiac insufficiency. The blood pressure was 95 mm. mercury during systole and 65 during diastole. The diagnosis of Addison's disease was made. The next day he was up at 10 but became much excited during the visit of some relatives, and was seen to walk up and down, gesticulating. At 11 he was put back to bed for a further test of the blood pressure. Suddenly, while preparations for this were being made, the patient fell back, as if struck by lightning, absolutely pulseless, but he kept on breathing for seventy or eighty seconds. The whole thing was over in from sixty to ninety seconds. Cheesy nodules were found in both suprarenals.

Steiger explains these cases by assuming that although the suprarenals were much damaged, the chromaffin system was yet able to supply the usual physiologic demand for epinephrin. The defective functioning of the suprarenals was manifested in the low blood pressure in all. Some special physical exertion or emotional stress, using up large amounts of epinephrin, upset the precarious balance; the insufficient chromaffin was not able to supply enough epinephrin to compensate, and the blood pressure consequently dropped suddenly through the entire cardiovascular apparatus. In experiments on animals such a sudden drop in the blood pressure entails instantaneously the collapse of the heart, and usually through fibrillation of the ventricles. In the fourth case above described this mechanism seems obvious; the heart action stopped entirely in thirty seconds, respiration keeping up for fifty seconds longer. The case is thus a typical instance of Hering's minute-heart-death (*Minutenherztod*).

In these cases of sudden death in the midst of apparent health, the epinephrin-producing system may be diseased alone or in combination with other glands with an internal secretion (status thymicolymphaticus, exophthalmic goiter, or pituitary trouble). The only reliable symptom of epinephrin deficiency is the extremely low blood pressure. Persons with this permanently low blood pressure should be given epinephrin systematically. It might be possible in this way to ward off sudden death from this cause. In any event, absolute physical quiet is imperative for them. He discusses the literature on the subject, and calls attention finally to the rare cases of a tumor in the chromaffin system stimulating the suprarenals to exaggerated functioning. The mass of epinephrin thus poured into the blood may induce such excessively high pressure in the cardiovascular system that it is unable to bear the strain, and acute heart failure may result. The outcome is the same, but the cause is an excess instead of a deficit of epinephrin. The persistence of the respiration after all signs of life from the heart have suddenly stopped is characteristic of these sudden fatalities from a deficit of epinephrin.

75. **Eclampsia without Convulsions.**—A primipara of 40 had passed through an apparently normal pregnancy and delivery, but five minutes after expulsion of the placenta she grew pale, the pulse rapid and weak, the extremities cold and she died in an hour and a half. There had been no convulsions or loss of consciousness, but necropsy revealed extensive hemorrhages in the liver and under the serosa of the gallbladder, with minute hemorrhages numerous elsewhere. The uterus had been pressing on the ureters, which had become dilated, the right in particular, with dilatation of the pelvis above. The child was in white asphyxia when born, and could not be revived; Chatillon says that he knows of only six cases on record in which eclampsia without convulsions occurred after delivery. The mortality in the children seems to be 100 per cent. Schmid in twenty-four cases was unable to find records of any infants having survived.

Gazzetta degli Ospedali e delle Cliniche, Milan

March 11, XXXVIII, No. 20, pp. 305-319

77 *Treatment of Mutism from Shell Shock. G. Saraceni and S. Bonelli.—p. 308.

77. **Traumatic Mutism of Long Standing.**—Saraceni and Bonelli report a case of hysteric mutism in a soldier with antecedents showing a tendency to hystero-epilepsy. The aphasia had lasted for over six months and treatment of all kinds in various hospitals had failed to break it. It resisted a long application of hypnosis, but finally yielded on a second application of hypnosis through an hour and a half.

Policlinico, Rome

April 8, XXIV, No. 15, pp. 473-504

78 Turning Over of Bullets. (Sul rovesciamento dei proiettili austriaci da fucile.) I. Scalone.—p. 473.
79 *Inflatable Rubber Tube Tourniquet. (Il laccio emostatico Pomponi.) V. Calo.—p. 476.
80 Present Status of our Knowledge of Dysentery. V. Forli.—p. 477.
81 Reforms Suggested for the Insane Asylums. (La riforma dei Brefotrofi.) M. Flamini.—p. 482.
82 Decayed Teeth as Affecting Military Service. A. Chiavaro.—p. 486.

79. **Pneumatic Tire Tourniquet.**—The rubber tube in a stout woven cover is inflated, like a bicycle tube, after it is in place. Among the various advantages of this form of tourniquet are that more air can be let in or air let out at any moment, without disturbing the patient. The pressure is even throughout, and no skill is required to apply this method.

Riforma Medica, Naples

March 24, XXXIII, No. 12, pp. 309-336

83 What Is To Be Done for the Tuberculous? A. Pirera.—p. 309.
84 *Etiology and Pathogenesis of Acne Rosacea. (Couperose.) P. F. Arullani.—p. 314.
85 *Factitious Affections of Arms or Legs Imposing as Sequels of War Wounds. A. Mori.—p. 319. Commenced in No. 11, p. 288.

84. **Acne Rosacea.**—Arullani has investigated with special care seventy-two cases of acne rosacea in order to determine the share of the cardiovascular system in the affection. He here gives the details of twenty-four cases all of which sustain his conviction that it belongs in the category of chronic constitutional affections. The predisposed are born with a heart that becomes dilated easily, while the blood pressure is low. Digestive disturbances, pregnancy, etc., tend to render the circulation still more sluggish, especially in the head. The capillaries in the skin become dilated, and as all modifications in the circulation are reflected preeminently in the face, the capillaries here become permanently enlarged and acne rosacea is the result. On account of their more sedentary life, it is more common in women, and everything that favors vascular congestions tends to aggravate it. Local measures of treatment are futile, except massage. The logical treatment is with tonics and other means to raise the hemoglobin percentage and render the circulation more active, with local massage by an expert.

85. **Factitious Affections of the Limbs.**—Mori describes sixteen cases, with eight illustrations, showing various lesions induced to avoid military service or obtain workmen's compensation. Malingering of this kind was described by Hippocrates, and all the ages have witnessed it, but it assumed epidemic proportions at the time of the Crusades and Napoleonic wars. In workmen it is the hand that is disabled; in soldiers, the leg. The workingman has only a mercenary purpose in view and the laws cannot be made too strict to repress and punish this. But in soldiers there are many extenuating circumstances. The forms he has encountered are edema from a constricting band, traumatic pseudarthritis of the knee, hard edema of the ankle and foot, and twisted foot—all closely resembling disability left by some war wound of the leg. In fifteen of his cases a constricting band had been applied to the leg just below the knee or above the ankle. In some, constriction was applied both above and below the knee. In every case there had been some gunshot or shell wound of the leg which had healed, and the factitious edema had been induced to simulate serious consequences.

All were on the left leg, with one exception. The man can apply the constricting band easier on the left leg, and can pretend to limp with it more easily. No permanent disturbance resulted in any case. The edema was always massive and terminated above at a circular line where a groove may show the imprint of the constricting band or, if not,

certain changes in the skin suggest that there has been constriction in this region. One of the illustrations shows edema of the left hand. The hand measured 38 cm. around at the base of the fingers, and 30 cm. at the wrist and forearm. The man had at the same time applied some irritating substance to a small wound on the forearm that kept it from healing. He had maintained this factitious lesion for a year, until Mori recognized its character and cured the whole in less than two weeks. He dressed the arm in a wire netting tube, preventing the man's further manipulations, and once a day had a nurse apply a hot mud bath to the arm. In a week the hand had returned to normal size. This factitious edema once installed can be kept up without further constriction by gravity, etc. On suspicion of simulation the man should be closely watched and examined at unexpected times, stripping off all the bed and other clothing, as constriction may be applied higher up. The edema subsides spontaneously when the limb is kept raised and, possibly, wound from the end upward.

Brazil-Medico, Rio de Janeiro

March 24, XXXI, No. 12, pp. 97-104

86 *The Venomous Fishes of Brazil. (Sobre os peixes venenosos.) O. O. R. da Fonseca.—p. 97. Commenced in No. 11, p. 90.
87 Some Helminths from the Collection in the S. Paulo Bacteriologic Institute. L. Travassos.—p. 99.

86. **Venomous Fishes.**—Fonseca says that the *Lagocephalus levigatus* is considered by the fishermen as the most poisonous of the fishes of Brazil. It frequents the southwestern Atlantic and has also been found in the Mediterranean, off the coast of Cuba, Florida and the Guianas. It has been found at a depth of 200 meters. (It is about 3 feet long, and is known as the smooth puffer.) The poisonous fishes of the spheroides family frequent shallow waters and seem to be restricted to the American Atlantic. Fonseca made 114 tests of the poisonous fishes, the results indicating that the blood, spleen and the kidneys of the *Spheroides testudineus* are not toxic while the other organs, muscles and skin are highly poisonous: 0.05 or 0.1 c.c. of an extract, representing 0.01 or 0.02 gm. of the fish liver, killed guinea-pigs in a few minutes. Young animals injected with extracts of them showed greater resisting power than the older animals. The poison has a paralyzing action on the nervous system. The poison dialyzes and seems to be thermoresistant.

Prensa Medica Argentina, Buenos Aires

March 10, III, No. 28, pp. 297-304

88 *Treatment of Anthrax in Man with Normal Serum. J. Penna, J. B. Cuenca and R. Kraus.—p. 297. Conclusion.
89 Changes in the Vesicular Murmur at the Apices of the Lungs. P. M. Barlaro.—p. 299.

Supplement, pp. 97-104

90 Influenzal Pneumonia. I. Allende.—p. 97. Conclusion.
91 Chronic Sigmoiditis. M. R. Castex.—p. 101.

88. **Effectual Serotherapy of Anthrax.**—Penna and Kraus here conclude their report of the excellent results obtained in anthrax or malignant pustule by intravenous injection of normal beef serum. At first they used prepared immune serum, but found to their surprise that normal beef serum was actually fully as effectual. All the fifty patients given this treatment promptly recovered. These results in the clinic corroborated the assertions of Kraus and Beltrami to the effect that normal beef serum protects rabbits against malignant pustule just as promptly and effectually as the immune serums. In the clinical cases the injection was made intramuscularly or subcutaneously in eighteen cases and the curative effect was equally pronounced. Among the typical cases described is that a man employed in a slaughterhouse to remove the hides of the cattle. A small itching pimple developed on the left wrist which rapidly spread and in five days had become transformed into a malignant pustule, the arm swollen, with high fever and pulse of 130. He was given two subcutaneous injections of normal beef serum, a total of 60 c.c., the fifth and sixth days, and improvement was evident in two days. By the thirteenth day he had quite recovered except that the glands in the axilla were still enlarged. The anthrax bacillus was cultivated from the vesicles.

Semana Medica, Buenos Aires

XXIV, No. 5, pp. 121-148

92 Pathology of the Placenta. (Estudio de los llamados polipos placentarios.) E. Zarate.
93 Progressive Facial Hemiatrophy. J. M. Obarrio.—p. 125.
94 Lymphocytosis in Syphilitics. C. P. Mayer and A. C. Gourdy.—p. 134. Continuation.
95 Filling Children's Teeth. E. Zawels.—p. 139.

No. 6, pp. 149-190

96 *Extraperitoneal Cesarean Section. (Operation de Ritgen-Latzko-Doderlein.) T. A. Chamorro.—p. 149.

No. 7, pp. 191-218

97 Gastrulation in Mammals. S. E. Parodi and V. Widakowich.—p. 191.
98 Present Status of Treatment of Puerperal Infection. P. V. Cernadas.—p. 195.
99 History of Public Health and Hospital Service in Argentina. E. R. Coni.—p. 199.

96. **Extraperitoneal Cesarean Section.**—Chamorro expatiates on the advantages of a combination of the Latzko and Döderlein technics as providing the ideal method for extraperitoneal cesarean section. Infection does not contraindicate it, and the cicatrix stands the strain of pregnancies later without harm. He gives an illustrated description of five cases in which he extracted the fetus safely by this method with contracted pelvis.

Mitteilungen a. d. med. Fakultät der k. Univ., Tokyo

March, XVII, No. 1, pp. 1-185. German Edition

100 *Etiology of Tsutsugamushi Disease. VIII. M. Ogata.—p. 1.
101 *Pathogenesis of Epithelioma. K. Yamagiwa and K. Ichikawa.—p. 19.
102 Behavior of Blood Corpuscles in Experimental Rabies in Rabbits. T. Koyano.—p. 69.
103 *The Larvae of Filaria Live Longer in Blood Impregnated with Carbon Dioxid. M. Yamada and T. Yamamoto.—p. 87.
104 Behavior of Sugar in the Blood after Ligation of Pancreatic Duct in the Rabbit. (Ueber die Bedeutung der Langerhansschen Inseln für den Kohlehydratstoffwechsel. I.) N. Kamimura.—p. 95.
105 The Cytolytic Immune Serum of the Islands in the Pancreas. (II.) N. Kamimura.—p. 127.
106 Epinephrin Scanty in the Blood during Glaucoma. K. Kusama.—p. 137.
107 Arcus Corneae Juvenilis Due to Fatty Degeneration of the Cornea. K. Kusama.—p. 159.
108 Microchemical Determination of Epinephrin. (Ueber die Menlesche Chromreaktion der sogen. chromaffinen Zellen und den mikrochemischen Nachweis des Adrenalins.) T. and A. Ogata.—p. 173.

100. **Tsutsugamushi Disease.**—Two colored plates show the biologic details of the fungus which Ogata has cultivated from this disease and with which he has reproduced it in rabbits and guinea-pigs.

101. **Experimental Cancer.**—Two tables filling four-page inserts and fourteen plates, one colored, show the details of the experiments with which epitheliomas were induced at will by repeatedly painting the inside of the rabbit ear with tar. The illustrations show the various steps of this malignant degeneration resulting in the anarchy of the epithelial cell. In some of the animals the emancipated epithelial cells proliferated into lymph or blood vessels, but no metastasis in internal organs was realized. In two cases, however, metastases developed in lymph glands not far away. The experiences related confirm the assumption that the mere continuance of the irritation suffices to induce malignant disease on the precancerous modified soil, without the intervention of any specific factor.

103. **The Filaria Lives Longer in Blood Containing Carbon Dioxid.**—This fact was apparently demonstrated by the research reported, and it is suggested as possible that this may be the reason why the filaria larvae are found in the blood at night rather than in the daytime.

Hospitalstidende, Copenhagen

March 28, LX, No. 13, pp. 297-320

109 *Oxyuris Vermicularis in Denmark. S. Müller.—p. 297.

109. **Oxyuris Vermicularis in Denmark.**—Müller examined 200 cadavers from the public hospital at Copenhagen and tabulates the findings, along with those from another hospital embracing likewise 200 cases. Müller's research included the appendix, and he found the oxyuris in 51 per cent. of the eighty-two men; in 42.8 per cent. of the seventy women, and

in 62 per cent. of the forty-eight children (under 15). The trichocephalus was found in 104 of the total 400 cadavers; in over 58 per cent. of the children between 5 and 10. The percentage declined with age, but even after 60 they were present in over 15 per cent. Müller is convinced that his findings indicate that at least 61 per cent. of the inhabitants of Copenhagen harbor the oxyuris, and that the proportion is probably much higher as the illness preceding death had probably reduced the numbers of the oxyuris. The trichocephalus was found in 71.4 per cent. of the patients from rural districts and only in 36.8 per cent. of the town patients.

Ugeskrift for Læger, Copenhagen

March 15, LXXIX, No. 11, pp. 409-438

110 *The Tongue as the Mirror of the Stomach, especially with Achylia and Pernicious Anemia. (Tungen som Mavens Spejl.) A. Faber.—p. 409.

March 22, No. 12, pp. 439-474

111 *Abdominal Symptoms with Cardiovascular Disease. V. Scheel. —p. 439.

112 *Mineral Substances in connection with Nutritional Disturbances in Infants. C. Friderichsen.—p. 446.

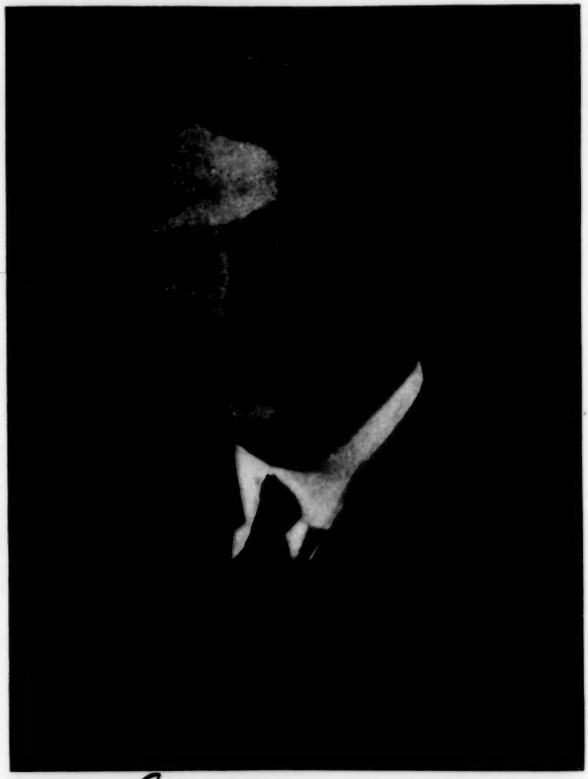
110. **The Tongue Mirrors the Stomach Lining.**—Faber comments on the revival of interest of late in the pathologic antecedents with stomach trouble, instead of relying too exclusively on the findings with test meals. The latter have recently demonstrated anew the influence of nervous factors in both the motor and the secreting functions of the stomach; for example, a patient may present achylia at one test meal and hyperchylia at a later one. But among all the numerous articles that have been published on these subjects in the last decade he has sought in vain for any study of the tongue. The case records mention merely dry, coated or raspberry tongue. Our fathers used to say that the tongue is the mirror of the stomach, but no one seems to heed this now, and Faber declares that by so doing we are closing our eyes to much valuable information. The mucosa of the tongue shares in the general gastro-intestinal atrophy with pernicious anemia. This atrophy of the tongue mucosa is even an early symptom of the latter and also of cancer, tuberculosis and other pathologic processes which entail atrophy of the stomach lining. In short, he affirms, atrophy of the mucosa of the tongue is a sign always of atrophy of the mucosa of the stomach. On the other hand, a coated tongue, with normal or large papillae, is a sign that hydrochloric acid is being secreted in normal or excessive amounts.

His research has also demonstrated that the saliva generally gives a strongly acid reaction in conditions which are accompanied by atrophy of the stomach. He reviews the literature on the tongue findings with various gastro-intestinal disturbances, and remarks that Boas has had little to say on this subject, dismissing the diagnostic significance of the aspect of the tongue as of "extremely subordinate import." Faber tabulates his findings in a total of 106 patients with stomach trouble repeatedly examined with test meals, etc., the saliva reaction tested, and the aspect of the tongue recorded. The tongue was found with a thin epithelium layer and few or no papillae, smooth, shiny, and never coated, in all the cases in which atrophy of the stomach mucosa was evident. In another group of 130 patients with various internal or constitutional diseases, the tongue showed no signs of atrophy except in five cases of pernicious anemia, one of cancer in the abdomen and one of granulomatosis. One patient had gastric achylia or retention, but the tongue was lightly coated and did not seem to be atrophied. This points to a nervous element in the achylia in this case rather than to organic atrophy of the stomach lining.

Faber cites Hunter's statement in 1913 that in 150 cases of pernicious anemia so many of the patients had a sore tongue that he ascribed diagnostic significance to this. He described it as "infective vesicles between the epithelium and the substance of the tongue, with marked neuritic and atrophic changes in the muscle fibers beneath." Faber gives a microscopic section of the mucosa of a normal tongue, with its crowd of high projecting papillae, and contrasts with it a section of an atrophic tongue with its smooth level surface. The aspect is like that of the gastric mucosa in cases of chronic gastritis, with or without cancer, and in cases of pernicious anemia. He cites a few cases to illustrate the diagnostic importance of atrophy of the tongue. In one, for example, a woman of 37 had not much over 3 million reds and 50 per cent. hemoglobin. The spleen was enlarged, the saliva acid, the tongue clean and atrophic. On the tongue findings, achylia was diagnosed, with pernicious anemia, and the course of the case confirmed the correctness of both assumptions. In another case the reds and hemoglobin figures were the same but the saliva was neutral and the tongue coated, with normal papillae. The diagnosis here was simple anemia, and the rapid recovery confirmed the diagnosis. In all his thirteen cases of pernicious anemia the tongue was invariably smooth, clean and atrophic. This finding is not peculiar to pernicious anemia but forms part of the general picture of progressive gastro-intestinal atrophy. Only two cases in his total material were encountered which conflicted with this general statement; the two women had chronic dyspepsia or hour-glass stomach. It is possible that the tongue findings warn of impending achylia. He remarks in conclusion that when we find marked atrophy of the tongue we can dispense with the test meal, unless future research upsets his deductions from his study of the tongue.

111. **Abdominal Symptoms with Cardiovascular Disease.**—Scheel reports a case of cardiac insufficiency in which repeated vomiting was the most prominent symptom. The patient was a woman of 49 and the vomiting had developed about five weeks before. There was occasionally some pain in the upper abdomen, possibly traceable to the enlarged liver and spleen. The Wassermann test was positive, and there were signs of myocarditis. The vomiting kept up to the end, independent of the meals, and necropsy disclosed no abnormal conditions in the stomach. The myocarditis was a diffuse sclerosis, of typically syphilitic character. In another case a man of 70 had abdominal pains, meteorism and constipation, but the bowels were not obstructed. The pains were restricted to the region of the cardia and hypochondrium but there was no dyspnea. The pains were so severe that morphin had to be given. They spread finally through the abdomen and the pulse grew weak. The diagnosis wavered between angina abdominis, arteriosclerosis and myocarditis, but necropsy after death the third week revealed a dissecting aneurysm of the abdominal aorta, without myocarditis. In a third case the main symptoms were vomiting, independent of meals, and pain in the left hypochondrium, with hematemesis. For some time the man of 66 had had a cough and some shortness of breath. The diagnosis wavered between myocarditis and infarction of the lung, but necropsy revealed both these and also coronary sclerosis. Death occurred two days after admittance to the hospital. The patients with such abdominal symptoms from their cardiovascular disease are liable to get treatment on an erroneous basis. The abdominal symptoms may be of the angina abdominis type or merely repeated vomiting. The prognosis with angina abdominis is favorable, as a rule. The spasm of the vessels causing it generally relaxes in time to ward off hemorrhagic infarction. In the young, spasm alone, with or without arteriosclerosis, may induce the angina abdominis. He advises abstention from tobacco and regulation of the diet to avoid overabundant meals. The drugs useful in angina pectoris can be given, including nitrites and iodid.

112. **Mineral Metabolism in Sick Infants.**—Friderichsen reviews the most important contributions to this subject that have been published in the last few years. They have deepened our knowledge of the importance of mineral salts for the infant organism, and the dangers when they are being washed out too freely in diarrheic stools. Some of the elements of the ash soon predominate over others, the output surpassing the intake. This shows that the organism is being drained of part of its own mineral content. In the mildest form of nutritional disturbances it is the earthy alkalies that suffer; in the next place, alkalies and chlorids, and in the severer forms we see calcium and phosphorus predominating over the other mineral elements in the demineralization process. This sequence is manifest in all the four forms of the Finkelstein system (acute intoxication; subacute gastro-enteritis; chronic decomposition, and fat dyspepsia).



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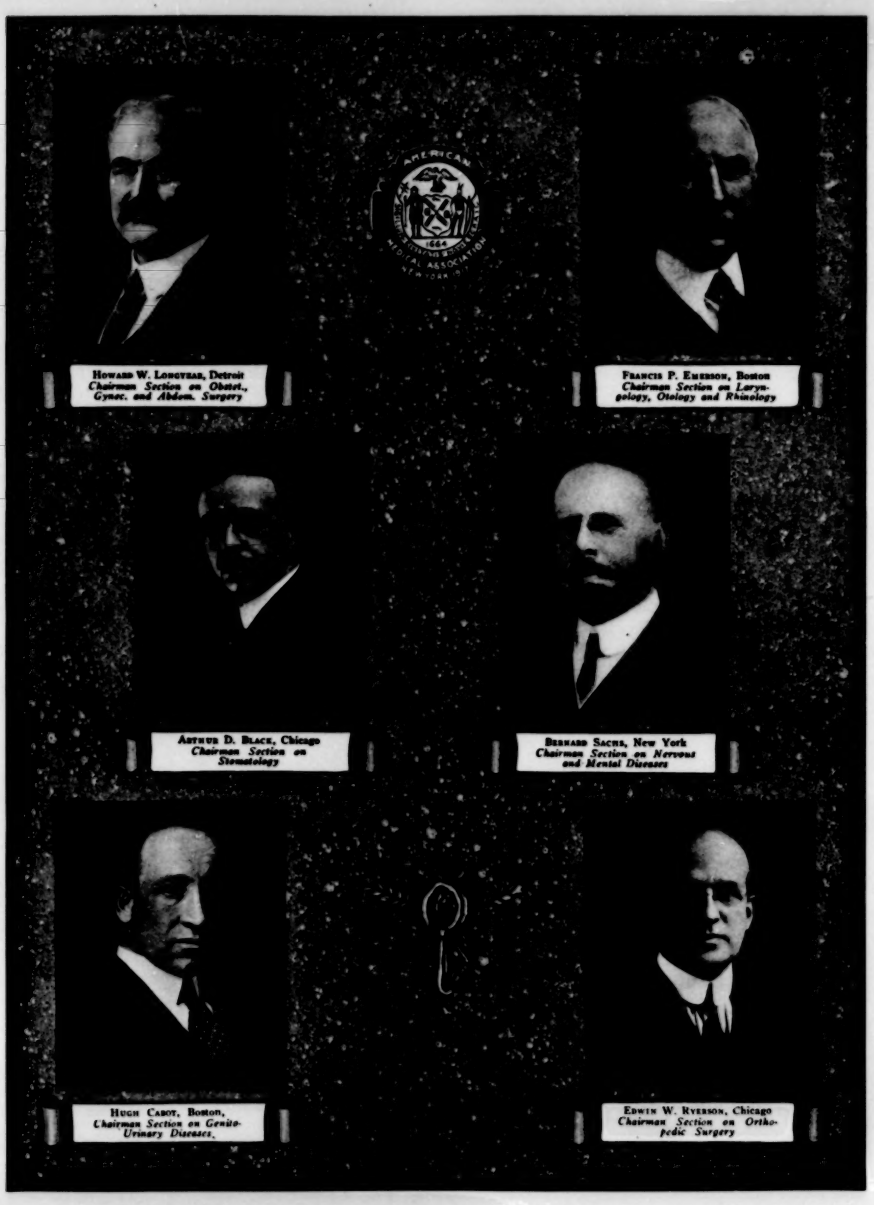

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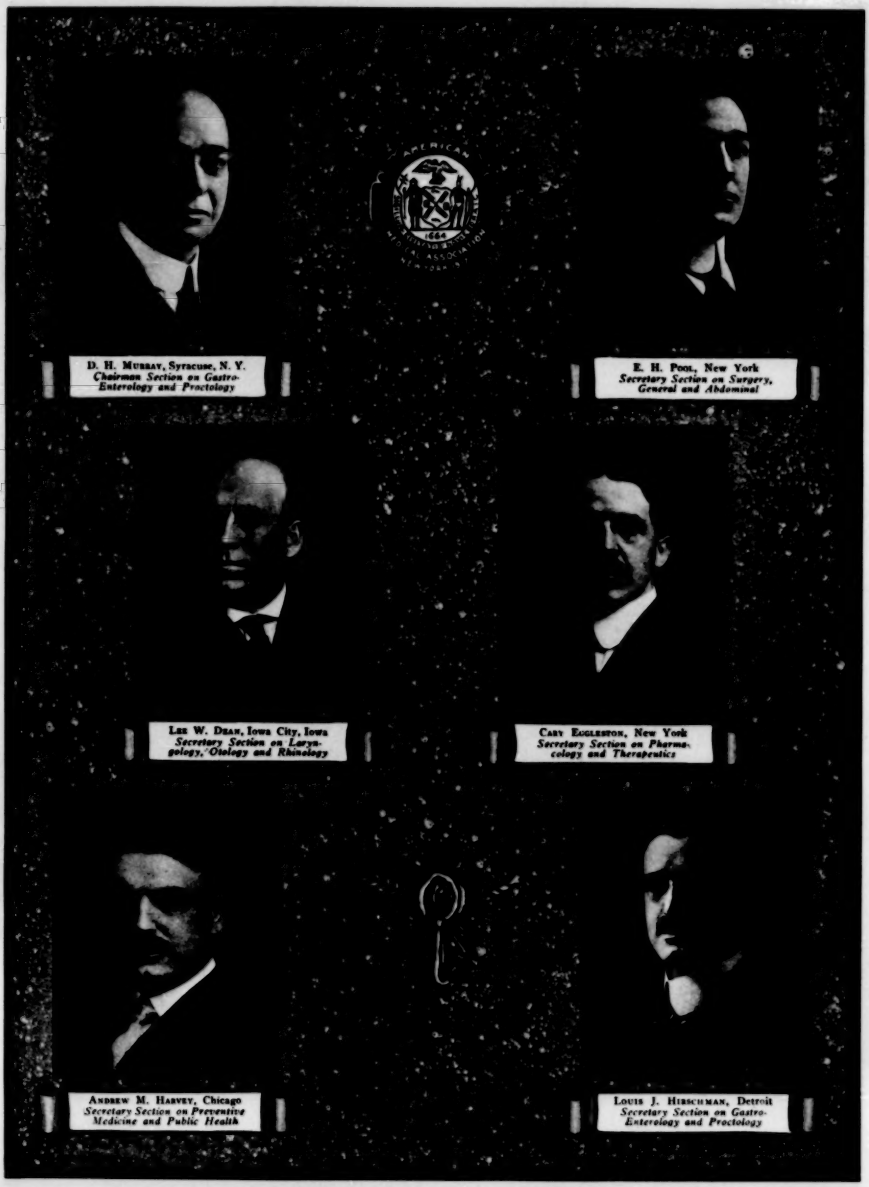
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